UNCLASSIFIED

[redacted]

2311-A

HEADQUARTERS
) STATES MILITARY ASSISTANCE COMMAND VIETNAM
APO SAN FRANCISCO 96222

AASWCC·CFSCC·DASC·ANGLICO·CFSCC·[redacted]

FIRE SUPPORT COORDINATION

[redacted]TACC·DASC·ANGLICO·CIC·FSCC·CSC·AASWCC·TACC

LESSONS LEARNED NUMBER 77

RELEASABLE TO RVNAF AND FWMAF

GROUP 4 - DOWNGRADED AT 3 YEAR INTERVALS
DECLASSIFIED AFTER 12 YEARS

UNCLASSIFIED

UNCLASSIFIED ~~CONFIDENTIAL~~

HEADQUARTERS
UNITED STATES MILITARY ASSISTANCE COMMAND, VIETNAM
APO SAN FRANCISCO 96222

MACJ3-052 20 May 1970

SUBJECT: Vietnam Lessons Learned No. 77: Fire Support Coordination in the Republic of Vietnam

SEE DISTRIBUTION

1. Attached for your information is a series of lessons learned from fire support operations conducted in the Republic of Vietnam. The central theme is the coordination of simultaneous fires from several sources on the same target area.

2. This publication was written primarily for two audiences:

a. Units which request and receive the fire support discussed here - artillery, armed helicopter, tactical air, and naval gunfire - to acquaint the commanders with the support available and with procedures for getting that support.

b. Agencies which develop and disseminate doctrine and instructional material, for possible use to reinforce, review, or revise doctrine or training in fire support coordination.

3. Comments or questions concerning this document, or requests for changes or additions to the distribution of Lessons Learned, should be addressed to this headquarters, ATTN: MACJ3-052. Lessons Learned published prior to 1970 may be obtained from the Defense Documentation Center, ATTN: DDC-TCA, Cameron Station, Alexandria, Virginia 22314.

FOR THE COMMANDER:

S. D. Serafini
S. D. SERAFINI
CPT, USA
Asst AG

3 Incl
1. Lessons Learned No. 77
2. Distribution
3. Index of Lessons Learned and Combat Experiences

REGRADED UNCLASSIFIED WHEN SEPARATED FROM CLASSIFIED INCLOSURE

UNCLASSIFIED ~~CONFIDENTIAL~~ UNCLASSIFIED

FIRE SUPPORT COORDINATION in the REPUBLIC OF VIETNAM

TABLE OF CONTENTS

Incl 1

FIRE SUPPORT COORDINATION
in the
REPUBLIC OF VIETNAM

LIST OF ILLUSTRATIONS

Fire Support Coordination in the Republic of Vietnam

1. PURPOSE. This publication presents a series of lessons learned on fire support coordination agencies, organizations, procedures, and techniques used by FWMAF, RVNAF, and US forces in the RVN.* Specifically, it deals with artillery, armed helicopters, tactical air, and naval gunfire support operations. The basic purpose of this publication is to document FSC in the RVN for -

a. Units which request and receive fire support, to acquaint commanders with the support available and with procedures for getting that support.

b. Agencies which develop and disseminate doctrine and instructional material, for possible use to reinforce, review, or revise doctrine or training in FSC.

2. SCOPE. This Lessons Learned deals with the broad subject of FSC as it is carried out in the RVN. It addresses the factors which make FSC in the RVN different from and more complex than those experienced in wars in other areas and points out where modifications of doctrine and accepted procedures are necessary or desirable to meet the situation as it exists in the RVN. It assumes a general knowledge of FSC principles, procedures, and techniques, such as those presented at US combat arms service schools. Separate Lessons Learned are devoted to:

a. Field artillery support. (ANNEX A)

b. Armed helicopter support. (ANNEX B)

c. Tactical air support, including reconnaissance. (ANNEX C)

d. Naval gunfire support. (ANNEX D)

e. Combined fire support coordination centers - an innovation in the RVN. (ANNEX E)

f. An after-action report, Operation COBRA STRIKE, a joint combined operation which illustrates the successful integration of several fire support means. (ANNEX F)

*FSC and combat operations in general in the RVN have each generated a unique and large set of terms and abbreviations. Hence, abbreviations have been used throughout this paper and are defined in the Glossary at Appendix G. In addtiion, long words, such as "headquarters" and "reconnaissance", which are used frequently have also been abbreviated.

3. GENERAL.

a. Definition. The US Joint Chiefs of Staff define FSC as "The planning and executing of fire so that targets are adequately covered by a suitable weapon or group of weapons". (JCS Pub 1)

b. Complexities.

(1) The definition itself needs no modification to apply to FSC in the RVN. However,several unique factors combine to make FSC in the RVN a complex and exacting procedure - more so than in previous wars. At the same time, fire support is more routinely available and in greater amount than in any previous war. In the great majority of cases, it is available in a matter of minutes - provided the ground commander knows of its availability and the procedures for securing it. The following factors tend to complicate FSC in the RVN:

(a) Parallel national command and communications channels (US, RVNAF, and FWMAF).

(b) Language difficulties.

(c) Populated and urban areas.

(d) Friendly and enemy intermixed.

(e) International, political, and tactical boundaries.

(f) Parallel national fire clearance procedures.

(g) Joint (multi-service) and combined (multi-nation) participation.

(h) Air warning requirements.

(2) These interacting factors, while resulting in a complex situation for the FSCOORD at any level, do not present an insurmountable problem. On the other hand, to appreciate the gravity of the situation, see MACV Lessons Learned No. 70, "Friendly Casualties from Friendly Fires", 17 October 1968.

c. Modifications. The unique situation in the RVN has resulted in modification of terminology, doctrine, and procedures in FSC to meet the existing situation. These modifications are summarized immediately below and are dealt with in more detail in later parts of the paper.

(1) Terminology.

(a) The term "free fire area" is not recognized officially at the MACV level; "specified strike zone" is the approximate equivalent term.

(b) "Air strike" is used in its usual sense, except that B-52 strikes are excluded; therefore, strike aircraft are defined as fixed wing aircraft of the fighter, bomber, and attack classifications capable of conducting an air strike.

(c) Populated and urban areas are numerous and for most purposes constitute "no-fire areas".

(d) There is no bomb line(s) in the RVN; the entire republic is considered to be inside the bomb line.

(2) Divisional artillery differs in varing degrees from the textbook organization. For example -

(a) There is no Honest John battalion in any of the infantry divisions in the RVN.

(b) Mixed calibers of artillery function as a unit at some FSBs.

(c) Some DS battalions have reorganized into two five-tube and two four-tube batteries.

(3) Field artillery support is widely available but the high degree of centralized control inherent in artillery doctrine is lacking, because of environment and nature of operations require wide dispersal of artillery.

(4) Deviations have been made from the fire support responsibilities inherent in the four standard field artillery tactical missions.

(5) The support of aerial artillery and other armed helicopters is much more extensive and available than might be the case elsewhere.

(6) TACAIR support is routinely available and in greater amounts than in any other war in history. Because of the relatively small area of the RVN and the presence of an extensive and elaborate TACS, TACAIR support is much more highly centralized than would be the case in a more conventional area of operations.

(7) TACAIR in the RVN has been tailored to operate in the relatively permissive environment that exists because of friendly domination of the air and lack of a really effective enemy air defense.

(8) A TACP is not normally found below brigade level in the RVN. In a more conventional situation, a TACP would be found with each maneuver battalion.

(9) The FAC is almost invariably airborne, as opposed to a more conventional situation where he would normally operate from a truck. This extensive use of the airborne FAC is dictated partly by the unfavorable terrain and environment and permitted because of friendly domination of the air and the enemy's limited air defense.

(10) Within its range, NGFS is routinely available for tactical operations along the entire coast of the RVN. In a more conventional environment, this support would probably be available for amphibious assaults only.

(11) The CFSCC has proved its value and its use is being constantly expanded.

4. FIRE SUPPORT COORDINATION IN THE RVN.

a. Fire Superiority and Coordination.

(1) Friendly forces in the RVN have a great margin of fire superiority over the enemy. The means to destroy the enemy are readily available, which is confirmed by daily operational results expressed as KIA ratios; the daily RVN-wide enemy to friendly KIA ratio is routinely 6 or 8 to 1 and often 10 or 12 to 1. The problem with most tactical operations is finding and fixing the enemy. Once this is done, he can be destroyed with coordinated air strikes, artillery, naval gunfire (if available), and armed helicopters. The successful application of the fire support depends on close coordination.

(2) The keys to successful integration of the several types of fire support are effective radio communication and close personal contact.

(a) The vital radio links are:

1 The artillery LO with the air and ground observers, artillery units, and armed helicopters.

2 The FAC and strike aircraft.

(b) The essential close personal contacts are:

1 The infantry battalion commander and his artillery LO, his primary FSCOORD.

2 The FAC (and/or NGF spotters) and air observers.

3 Ground observers and maneuver elements.

4 Military commanders and local RVN government officials.

b. The Ground Commander's Role. Most fire support planning and control in the RVN is at maneuver battalion level. The procedure which has evolved allows timely and effective engagement of targets by several fire support means with a minimum of danger to friendly troops and civilians. One such system is described below.

(1) FSC is usually exercised by the battalion commander through his artillery LO. Most operations are controlled from a command and control helicopter in which the commander and his artillery LO are located, all fire support (TACAIR, artillery, NGF, and armed helicopters) being controlled through the artillery LO. This procedure applied to artillery support is not unusual, but the method of coordinating TACAIR with other fire support will serve to illustrate the techniques which make the system so effective. TACAIR is controlled through an airborne FAC, who is in UHF radio contact with the strike aircraft. An artillery air observer is with the FAC; the air observer is in contact with the artillery LO, the ground FOs, the artillery battalion and battery FDCs, and the firing batteries on the artillery FM fire direction net. This system allows the battalion commander, through his FSCOORD (the artillery LO) to control the artillery fires and the TACAIR support. A similar system with an air observer riding with the NGF spotter would extend the control to include NGF support.

(2) An example illustrates how near-simultaneous engagement of a target by several fire support means can be achieved by using this or a similar system. Assume a typical LZ preparation involving the use of artillery, TACAIR, and armed helicopters - the LZ being in a valley with high ground on both flanks. The sequence of actions during the LZ preparation might be as follows:

(a) Artillery fires are coordinated by the artillery LO and placed on the LZ under control of the air observer riding with the FAC.

(b) The artillery is shifted to block probable escape routes off the LZ and TACAIR is brought in under control of the FAC.

(c) When the strike aircraft have expended most of their ordnance, the FAC notifies the artillery LO through the air observer. The artillery LO alerts the armed helicopters which, as the strike

aircraft make their last pass on the LZ, provide suppressive fires, then escort the troop carrier helicopters into the LZ.

(3) This second example illustrates the actual simultaneous engagement of the enemy by several fire support means. This action, which may well emerge as one of the classic examples of FSC in the RVN, took place in June 1969 at the 25th US Infantry Division's FSB Crook,northwest of Tay Ninh City near the Cambodian border.

(a) FSB Crook was circular, contained six US 105mm howitzers, and was defended by one reinforced US rifle company. Supporting artillery included 12 US and ARVN tubes of various calibers. TACAIR and helicopter gunships were available on call.

(b) Fire planning for the defense of FSB Crook was as follows:

1 A circular band out to 700 meters from the perimeter was to be covered by direct artillery fire from within the perimeter.

2 A north-south stream just west of FSB Crook was designated as a "safety line"; aerial fires were restricted to one side of this line and supporting artillery fires were restricted to the other side. This safety line concept is not contained in current FSC texts but had the effect of establishing a fire coordination line, two no-fire areas (one for artillery and one for aerial fires), and a restrictive fire plan for safety of friendly aircraft; in addition, it served as the basis for developing the artillery and air fire plans.

(c) The defense of FSB Crook, to include an early warning system, was planned six days in advance and the plan was executed as written.

(d) When the enemy attack came, the six 105mm howitzers within the FSB placed close-in direct fire around the perimeter.

1 At the same time, supporting artillery fired preplanned concentrations in its sector in areas beyond the outer ring of these direct fires.

2 All aerial fires were controlled by a USAF FAC on a specified UHF frequency, clearing the FM voice command net for use by the ground commander. Aircraft were committed to assigned sectors as they arrived on station. Aircraft sectors were divided by visible terrain features to permit the simultaneous use of helicopter gunships and fixed wing aircraft. Continuous 7.62mm minigun coverage by AC-47 (Spooky) and AC-119 (Shadow) gunships was augmented by high-performance fighter delivery of heavy ordnance and napalm.

(e) The perimeter of FSB Crook was not penetrated. Planning and FSC had permitted the simultaneous use of artillery and aerial fires. Friendly losses were one killed and three wounded; 402 of the enemy died in their futile assault on FSB Crook.

c. Rules of Engagement. For various reasons, e.g., populated and urban areas, intermingling of enemy and friendly civilians, international borders, and religious monuments and buildings, fire support in the RVN must conform to specific rules of engagement. These rules are jointly formulated and published by MACV in Directive 525-13 and the RVNAF JGS; they are applicable to the US, FWMAF, and RVNAF. The rules are not intended to restrict commanders unncessarily in the performance of their missions, but they are necessary to limit the risk to the lives and property of friendly forces and civilians and to avoid the violation of operational and international boundaries. Subordinate headquarters are not allowed to modify or make substantive interpretations of the rules of engagement. These rules will not be be discussed further here except to stress the extremely important mutual relationship between them and FSC.

5. SUMMARY. Techniques which permit the simultaneous use of several fire support means in one target area have been proved in combat in the RVN. Effective FSC is basic to our military effort here. It has been the deciding factor in many engagements and has greatly contributed to our success thus far. With Vietnamization, its importance will not diminish. FSC has been aptly described as a "performing art" rather than a science, the fire support plan being the "single sheet of music" from which the FSCOORD orchestrates for the commander within his organization.

ANNEXES:

A - Field Artillery Support
B - Armed Helicopter Support
C - Tactical Air Support
D - Naval Gunfire Support
E - Combined Fire Support Coordination Centers
F - After Action Report: Operation COBRA STRIKE
G - Glossary of Abbreviations

ANNEX A

FIELD ARTILLERY SUPPORT*

1. INTRODUCTION. At present in the RVN, FA units are using 105mm and 155mm howitzers (towed and SP), 8" howitzers (SP), and 175mm guns (SP). Some units have 4.2" mortars which are used primarily in base camp defense missions, e.g., illumination and final protective fires, and in a few cases to provide coverage to FSBs which are out of range of other suitable FA support. Basically, FA provides maneuver and territorial support in the RVN.

2. COMMAND AND CONTROL.

a. Basic Considerations. FA is most effective when control is centralized at the highest level consistent with the unit's capabilities and the mission. Contrasted to a more conventional war, the nature of operations in the RVN, conducted in abnormally large AOs, dictates a greater decentralization of fire support. Planning and control are decentralized to provide flexibility for offensive operations; on the other hand planning and control are centralized and detailed for defensive operations. In the RVN, both offensive and defensive operations are frequently conducted simultaneously within a brigade AO, and the FA is faced with the task of executing both offensive and defensive doctrine simultaneously.

b. Positioning. Artillery must be positioned to support tactical operations and to provide area support for installations and main supply routes. The concept of greater area coverage, plus the mobility provided by the helicopter, make it possible for some artillery to be within range of a maneuvering force at all times. This concept generally outweighs the desirability for massing the fires of an FA battalion against the relatively small targets usually found in the RVN. Centralized tactical control by corps-level artillery headquarters is considered essential to insure maximum coverage of the AO. Instances occur where the displacement of a direct support battery requires the approval of a corps-level artillery headquarters.

c. Tactical Missions.

(1) The four standard tactical missions of FA are direct support, reinforcing, general support, and general support-reinforcing. Each of these missions has certain inherent responsibilities which are

*This annex reflects primarily Army artillery support in the RVN. USMC procedures can be expected to vary slightly in some respects.

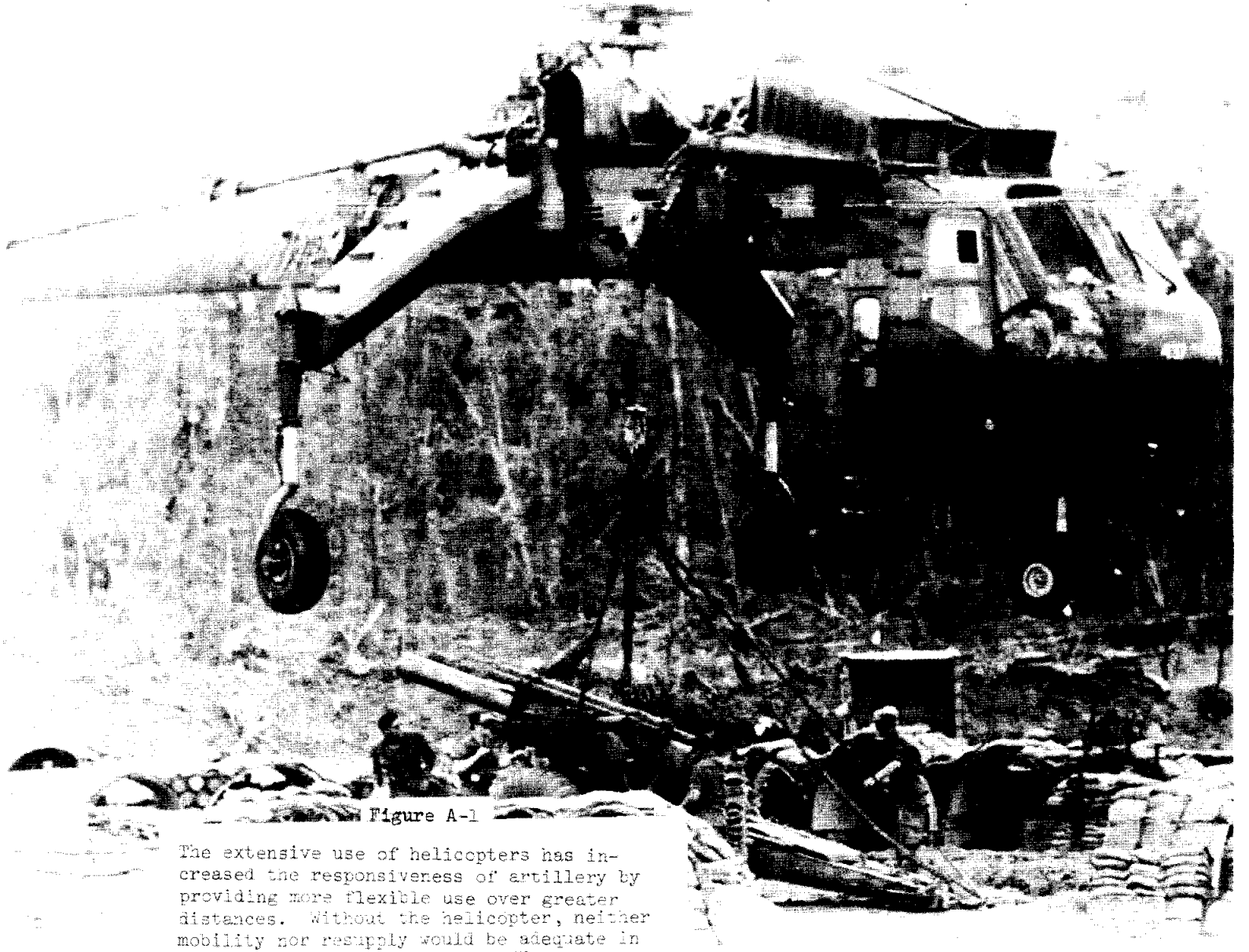


Figure A-1

The extensive use of helicopters has increased the responsiveness of artillery by providing more flexible use over greater distances. Without the helicopter, neither mobility nor resupply would be adequate in the environment found in the RVN.

outlined in Figure A-2. While complete agreement will not be obtained, the majority of USA artillery commanders and staff officers believe that deviations have been made from the responsibilities inherent in the standard tactical missions as executed in the RVN. These deviations are outlined in Figure A-3.

(2) The assigning of a different tactical mission to an artillery battery from that assigned to its parent battalion is common in the RVN. An example is a division artillery battalion with a general support mission, while one battery is in a direct support role and two batteries are in general support-reinforcing roles. These situations result from the many and varied types of operations being conducted simultaneously by an infantry battalion with one or more batteries in support.

(3) Operational control is a status normally associated with infantry and armor operations, but frequently used by artillery in the RVN in lieu of one of the standard tactical missions. Those favoring operational control believe that it is more flexible in meeting the rapidly-changing artillery support requirements in the RVN. It is used primarily when a battery operates under control of other than its parent battalion, and the distances involved make tactical and logistical support by the parent battalion impossible or impractical. The inherent responsibilities of operational control as an FA tactical mission are not well defined and its use requires considerable coordination.

d. Liaison. The infantry battalion commander's relationship with his artillery LO was touched upon in the opening paragraphs of this publication. It is stressed here because the need for effective liaison has never been greater than it is in the RVN. The large size of AOs, plus a frequent shortage of aircraft for command liaison purposes, make it difficult for artillery commanders to maintain personal contact with maneuver commanders. The requirement to obtain artillery fire clearances, from up to five separate military and political HQ, results in a demanding liaison requriement. The need for mature professionally-qualified LOs is a constant problem for all artillery commanders. Other factors which may limit liaison are great distances between HQ, insecure or nonexistent road nets, and shortage of TOE personnel.

e. Control of Observers. The method of controlling FOs depends largely on the manner in which they are used.

(1) The divisional DS battalions normally use their FOs with the companies of the supported maneuver battalions. Therefore, the most efficient control of the FOs is usually obtained through

(Inherent Fire Support Responsibilities)

An FA unit with a mission of --	Has as its zone of fire -	Furnishes forward observers -	Establishes liaison with --	Establishes communication with --	Answers calls for fire in priority from	Has its fires planned by --	Is positioned by
Direct support.	Zone of sptd unit.	To each company size maneuver element of sptd unit.	Sptd unit, down to bn level.	Sptd unit.	1. Sptd unit. 2. Own observers. 3. Force arty HQ.	Develops own fire plan.	Unit cmdr as necessary or ordered by force arty HQ.
Reinforcing.	Zone of fire of reinfd arty unit.	Upon request of reinfd arty unit.	Reinfd arty unit.	Reinfd arty unit.	1. Reinfd arty unit. 2. Own observers. 3. Force arty HQ.	Reinfd arty unit.	Reinfd arty unit or ordered by force arty HQ.
General support.	Zone of sptd unit.	No inherent requirement.	No inherent requirement.	No inherent requirement.	1. Force arty. 2. Own observers.	Force arty HQ.	Force arty HQ.
General support - reinforcing.	Zone of sptd unit, to include zone of reinfd arty unit.	Upon request of reinfd arty unit, subject to prior approval of force arty HQ.	Reinfd arty unit.	Reinfd arty unit.	1. Force arty HQ. 2. Reinfd arty unit. 3. Own observers.	Force arty HQ.	Force arty HQ or, subject to prior approval, the reinfd arty unit.

Abbreviations used above: Arty - Artillery; Cmdr - Commander; HQ - Headquarters; Reinfd - Reinforced; Sptd - Supported.

Figure A-2

FIELD ARTILLERY TACTICAL MISSIONS
(Deviations in the RVN from Inherent Fire Support Responsibilities)

An FA unit with a mission of -	Has as its zone of fire	Furnishes forward observers to -	Establishes liaison with -	Establishes communication with -	Answers calls for fire in priority from -	Has its fires planned by -	Is positioned by -
Direct support.					All observers within range.		Displaces only on orders of force arty HQ.
Reinforcing.	Range of its weapons.			No requirement for external wire.	1. Reinforced unit. 2. All observers within range.		
General support.	Range of its weapons.				Direct from all observers within range.	Units to which rendering general support.	
General support - reinforcing.	Range of its weapons.			No requirement for external wire.	1. Reinforced unit. 2. Direct from all observers within range.	Reinforced unit.	

Figure A-3

the artillery LO at the maneuver battalion.

(2) The non-divisional GS battalions have two methods of using their FOs, and two methods of control. The FOs are assigned either to the companies of the supported maneuver battalions, or they are assigned individually to specific units for specific operations. In the latter case, there are no LOs to control the FOs; they are independent and work directly with the S3 or artillery units providing fire support. When a GS battalion provides support similar to a DS role, the FOs are controlled by the artillery LO.

(3) Air observers are normally used by the HQ to which they are authorized, frequently being consolidated at division or group level. In both cases, the air observers are primarily controlled by the HQ using them, the control being quite flexible. Given a sector of operation, the air observers conduct registrations and visual surveillance, engages targets with artillery, and performs many other functions. The control exercised by the using HQ does not usually restrict the observers' operations.

3. TACTICS AND TECHNIQUES.

a. Doctrine. Artillery doctrine has been shown to be sound for employment in the RVN although the operations bear such relatively new designations as counterguerrilla, counterinsurgency, and stability operations.

b. Clearances.

(1) The requirement for military and political clearances for artillery fire on or near populated areas has an adverse effect on the responsiveness of artillery fire. The goal of having rounds in the target area within two minutes after receiving the fire request is seldom met for targets near any populated area. It is common for missions to be delayed up to ten minutes to obtain all the necessary clearances - the average delay is about seven minutes - but it is not uncommon for the artillery to be unable to fire at all because of lack of clearances near populated areas. The establishment of CFSCCs in some areas has significantly reduced the time requried to effect clearance. (See Figure A-9 and Annex E.) This lack of responsiveness is a source of constant concern and frustration at all echelons of command.

(2) A special type of clearance is used in most areas of the RVN when friendly artillery fires are to be placed within 600 meters of friendly forces or installations. This is considered a "DANGER CLOSE" situation. All such missions must be observed and special precautions must also be used to insure the safety of friendly troops.

(a) The ground commander is ultimately responsible for the decision to fire and for the safety of friendly troops. He must know the location of friendly forces at all times and insure that observers and FDCs are kept informed of these locations.

(b) When artillery fires are to be placed within 600 meters of friendly forces, the observer must inform the ground commander that a DANGER CLOSE situation exists. In his fire request the observer will specify "DANGER CLOSE" immediately after the target description.

(c) The first round for adjustment is usually a high-burst marking round, either WP or smoke. Corrections will be in increments of no greater than 100 meters; contray to normal adjustment procedures, "creeping" is encouraged in this situation.

(d) Within 200 meters from unprotected or lightly-protected troops, there is a significant risk of friendly casualties. The decision to place the fire within 200 meters will be made by the ground commander.

(3) The following minimum safe distances maybe used as a guide for a reasonably casualty-free risk to friendly troops:

(a) For artillery fires within 400 meters, troops should be prone.

(b) For artillery fires within 200 meters, troops should be protected, e.g., in armored vegicles, bunkers, trenches, or foxholes. As a minimum, they should be prone and behind cover, such as an armored vehicle or rice paddy dike. FACs, LOs, and observers should be consulted for specific safety criteria for various weapons.

c. Concepts and Emphasis. The concept of using the majority of the artillery for area defense was used by the French and later by the ARVN. In practice, this concept is still in effect by US artillery, but with equal emphasis on support of maneuver units. Nondivisional artillery is concerned primarily with providing area coverage, emphasizing main supply routes and populated/logistical areas. Divisional artillery is concerned primarily with supporting the maneuver elements. There is, of course, no precise dividing line between these areas of primary concern and overlap exists.

d. Fire Support Bases.

(1) Artillery positions in the RVN are usually known as "fire support bases". (The term "fire support base" has become a generic term in the RVN and is sometimes used for various types of military installations even though fire support may not be their

Figure A-4

Frequent displacement of artillery is the rule in the RVN and may involve anything from a single piece to a complete battery. Displacement may be temporary to support a specific operation or to conduct an artillery raid - offensive operation using only artillery fires. Displacement may also be relatively permanent, as in this case where the 1st US Air Cavalry Division occupied FSB Vivian with a battery of 155mm howitzers.

mission.) The selection of FSBs is rarely left completely to the artillery commanders concerned. The prime consideration is the capability to support the maneuver element throughout its AO; coupled with the size of many AOs and the absence of clearly identified enemy and friendly areas, this dictates a requirement for 360° (6,400 mil) coverage. The ability of FSBs to be mutually supporting is also considered by many to be paramount. Other considerations in order of priority are:

(a) Type of soil to support the weapons.

(b) Defensible position.

(c) Capability of being resupplied by air.

(2) Where a choice exists, high ground is selected for an FSB in preference to one in defilade. The defensibility of high ground is the primary reason for this preference. Enemy control of high ground surrounding a defiladed position enables him to deliver effective fire into the position. The enemy's principal counter-battery weapon is the mortar, against which a position in defilade offers little protection.

(3) It is exceptional to find an FSB where the artillery commander was consulted prior to designating areas of occupation within the perimeter. The highest portion is usually occupied by an infantry battalion or company command post. Positioning the artillery on the higher ground would greatly increase its direct fire capability; conversely, it would be more vulnerable to enemy direct fire.

e. Type Operations.

(1) The airmobile operation is conducted frequently in the RVN.

(a) The complexity of the operation, caused by the number of different fire support means, requires that the operation be controlled and coordinated very closely. The success or failure of an airmobile assault preparation depends on the exactness with which FSC is accomplsihed.

(b) The preparation of LZs is the most common artillery preparation fired. Preparations are fired on LZs used for airmobile insertion or landing of groups of personnel varying from small patrols to several companies. The purpose of the preparations is to reduce or eliminate resistance, clear away helicopter mines or other mines and booby traps, and reduce foliage in the area. In some cases,

preparations are used to deceive the enemy into thinking that an insertion is being made.

(2) Availability of artillery support is one of the primary factors in determining whether operations will be conducted. Prior considerations for artillery support normally insure that operations will not be limited because of range, projectile characteristics, or lack of continuous support; there are few instances where operations are limited by lack of artillery support.

(3) The major portion of artillery support is for tactical operations, however it is provided also for civil affairs, psychological, and intelligence operations.

(a) Representative types of offensive fires include intelligence and interdiction missions, preparations, countermortar/counter-rocket fires, and augmentation of B-52 strikes.

(b) Representative types of defensive fires include defensive targets near FSBs, base camps, etc; final protective fires; on-call targets along convoy and patrol routes, axes of advance, and in AOs for general use; blocking fires for patrols, around LZs, and around cordoned areas; countermortar/counter-rocket fires planned for use in case of attack; illumination; fires using VT fuze and beehive rounds planned on friendly positions in case they are overrun; and prearranged direct fire in defense of base camps, FSBs, and defensive positions.

(4) Figure A-5 gives an indication of the types and distribution of ammunition available to support operations in the RVN.

4. FIRE SUPPORT COORDINATION.

a. General. Operations in the RVN present many new and challenging situations in FSC. The basic concepts of fire support have not changed as a result of the "6400 mil" environment in the RVN. Fire support remains flexible and is one of the principal resources available to the maneuver commander. No new concepts of FSC have been devised; however new procedures and techniques have been developed. Fire and maneuver are very much interdependent and are planned concurrently. The maneuver commander at each echelon is responsible for the coordination of fire and maneuver. The senior artillery officer of the force is the FSCOORD and is responsible to the commander for the total integration of fire support. The establishment of FSC procedures and agencies is flexible; no rigid system is equally effective at all echelons or in all organizations. Procedures to accomplish the FSC task vary with the headquarters, type artillery organization, the amount and type of fire support

Type Ammunition	Rounds Per Weapon	Battalion Weapon Strength	Total Rounds Battalion	Total Rounds Firing Position	Unit Trains
Howitzer, 105mm	285	18	5130	1008	4122
HE	(214)		(3852)	(756)	(3096)
HEAT	(5)		(90)	(18)	(72)
Illuminating	(15)		(270)	(54)	(216)
WP	(18)		(324)	(54)	(270)
Smoke	(7)		(126)	(18)	(108)
Beehive	(6)		(108)	(36)	(72)
Select	(20)		(360)	(72)	(288)
Howitzer, 155mm	225	18	4050	1280	2770
HE	(150)		2700	810	1890
Illuminating	(25)		450	225	225
WP	(12)		216	75	141
Smoke	(18)		324	98	226
ICM	(20)		360	72	288
Howitzer, 8-inch	155	6	930	465	465
HE	(148)		(888)	(444)	(444)
Select	(7)		(42)	(21)	(21)
Gun, 175mm	175	6	1050	525	525

Figure A-5

Typical Army Ammunition Basic Loads

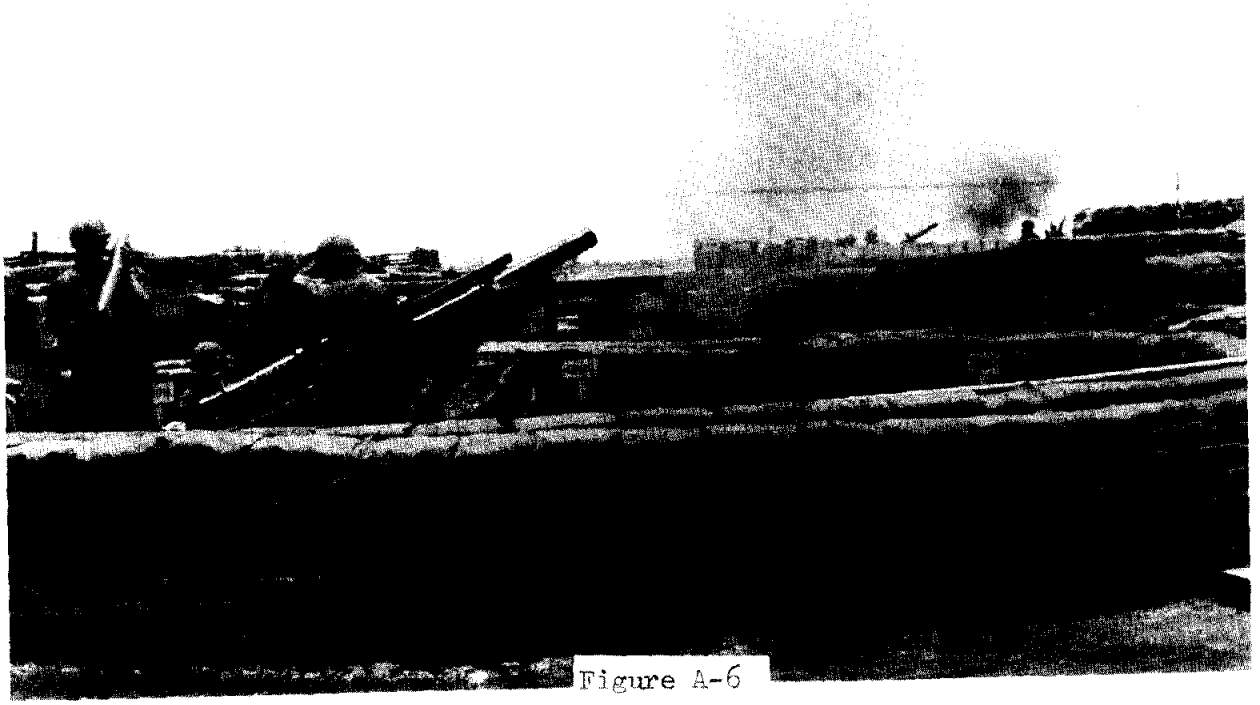


Figure A-6

Artillery must be prepared to deliver fire in any direction in the "6400-mil" environment in the RVN. Note the azimuth signs to assist in rapid laying of the tube in any direction.

available, and the type of operation. Most operations at maneuver battalion level involve planning time varying from a few hours to two days. Because of this short planning time, the majority of the planning procedures have been standardized and include in SOPs.

b. Applied Principles. Primary consideration is given to furnishing the type of fire support requested. Fire missions are assigned to or requested of the agency that can deliver the most effective and safe fire within the requested time. Fire support is provided by the lowest echelon having the necessary means available. When appropriate means are not available, assistance is requested from higher echelons of FSC. Fire support is coordinated at each echelon to the degree required by the mission. Final action is taken at the lowest level which can effect complete coordination of the fire support mission. The necessary precautions to safeguard friendly troops and RVN civilians and their property, aircraft, vessels, and installations are taken at each echelon where fire support is coordinated.

c. FSC Agencies. The FSC agencies established in the RVN are flexible; the composition of the agency is determined at each level of command.

(1) The divisional and separate brigade DS battalions provide FSC agencies according to their TOE. The agencies consist of the DS battalion commander as the FSCOORD, LOs and sections with each supported brigade and maneuver battalion, and FOs with each maneuver company. The majority of the divisional DS battalions are responsible for operation of AASWCCs in the division AO and obtaining fire clearances for the batteries under their control.

(2) GS battalions are not usually organized with FSC agencies. Their normal mission is to provide reinforcing fires to other artillery battalions. Frequently the GS battalions in the RVN have this normal organization modified to assist fire support of specific tasks or missions. These modifications include:

(a) DS to a maneuver force, which requires providing LOs to battalions and FOs to companies.

(b) Operation of AASWCCs.

(c) Artillery support and the coordination of other fire support for defense of base camps.

(d) Organization of CFSCCs.

(e) Obtaining clearances for fires of the batteries under their control.

(3) Artillery group headquarters in the RVN, for the most part, function in the conventional manner.

(4) Division artillery headquarters.

(a) At the division level, a more formal agency is established for FSC purposes; this is the FSC element of the division TOC. The FSC element normally performs the function of coordinating supporting fires on surface targets which cannot be done at a lower level, allocating and positioning fire support means for operations and area defense, nominating targets for B-52 strikes, supervising the AASWCC program within the division AO, obtaining clearances for fires outside the division AO, and sometimes operating a targeting section.

(b) Within the RVN, most division artillery headquarters retain a conventional organization while others are modified in varying degrees. The differing organizational concepts have no major influence on FSC as most operations are conducted at a lower level.

(5) The organization of the field force and corps artillery headquarters in the RVN varies. Two of these headquarters divide FSC into two parts - the ground-to-ground fire support means are under the artillery FSCOORD and air-to-ground means are under the G3. The third headquarters operation involves total integration of fire support under the FSCOORD. Again, these varying organizations have no major influence on FSC as most operations are carried out at much lower levels.

d. Functions of FSC Agencies.

(1) The FO with the maneuver company submits target lists to the artillery LO at the maneuver battalion. The FO also assists the company commander in coordinating the fire support available to the unit.

(2) The artillery liaison section at the maneuver battalion incorporates the target lists from the FOs into the battalion fire plan which is sent to brigade for approval. The artillery LO also works closely with the maneuver battalion commander in coordinating the fire support available to the battalion.

(3) The artillery liaison section and the FSCOORD at brigade coordinate the fire support available to the brigade and make recommendations for support of various organizations.

(4) The division, corps, and field force FSC elements coordinate fire support for major operations.

e. Artillery Fire Request Channels.

(1) Those established and used within the divisions in the RVN are standard or similar, for the most part. Figure A-7 shows the channels most commonly used within the divisions. The fire request channels established within the artillery groups are similar.

(2) The channels are not normal for GS battalions, as a result of the varied missions of the battalions. (See Figure A-3.) It is common for group batteries to reinforce specific artillery batteries and battalions; this has led to the establishment of modified fire request channels which frequently follow "short cuts" and by-pass the parent artillery battalion. The group headquarters usually is not aware of the missions being fired by its batteries. Figure A-8 shows typical modified fire request channels used for obtaining GS reinforcing fires from group artillery batteries. Rough percentages of total fire requests for each channel are indicated.

f. Accomplishment of FSC.

(1) In about nine out of ten cases, FSC at maneuver battalion or lower is done on an informal basis. Very few detailed fire plans are written. Most operations are begun with little advance warning; therefore, plans are made informally, follow SOPs and are kept simple, and are passed on verbally or by secure radio. Those fire plans which are reduced to writing are usually for contingency plans or for large-scale or joint/combined operations. Day-to-day operations are planned at the lowest possible level. In most cases, they are planned on an informal basis and coordinated by radio or telephone. The written fire plans are usually abbreviated and consist of only a target list.

(2) The artillery LO at maneuver battalion fills a key position. He is responsible for most of the fire planning and eventual coordination of all fire support. He usually accompanies the maneuver commander on all tactical missions.

g. Air Advisories.

(1) All artillery, from battalion up, has a vital interest in air advisories over their AOs. Air advisories above 5,000 feet are controlled by the AF and below 5,000 feet by the appropriate tactical commander. Each field force and corps is responsible for the air advisory activity in its AO. Habitually, the responsibility of operating the air advisories is assigned to lower levels; about three out of four DS battalions operate an air advisory. The air advisories are given local names, such as AASWCC in the south and "Sav-a-plane" agencies in the north. Regardless of their names,

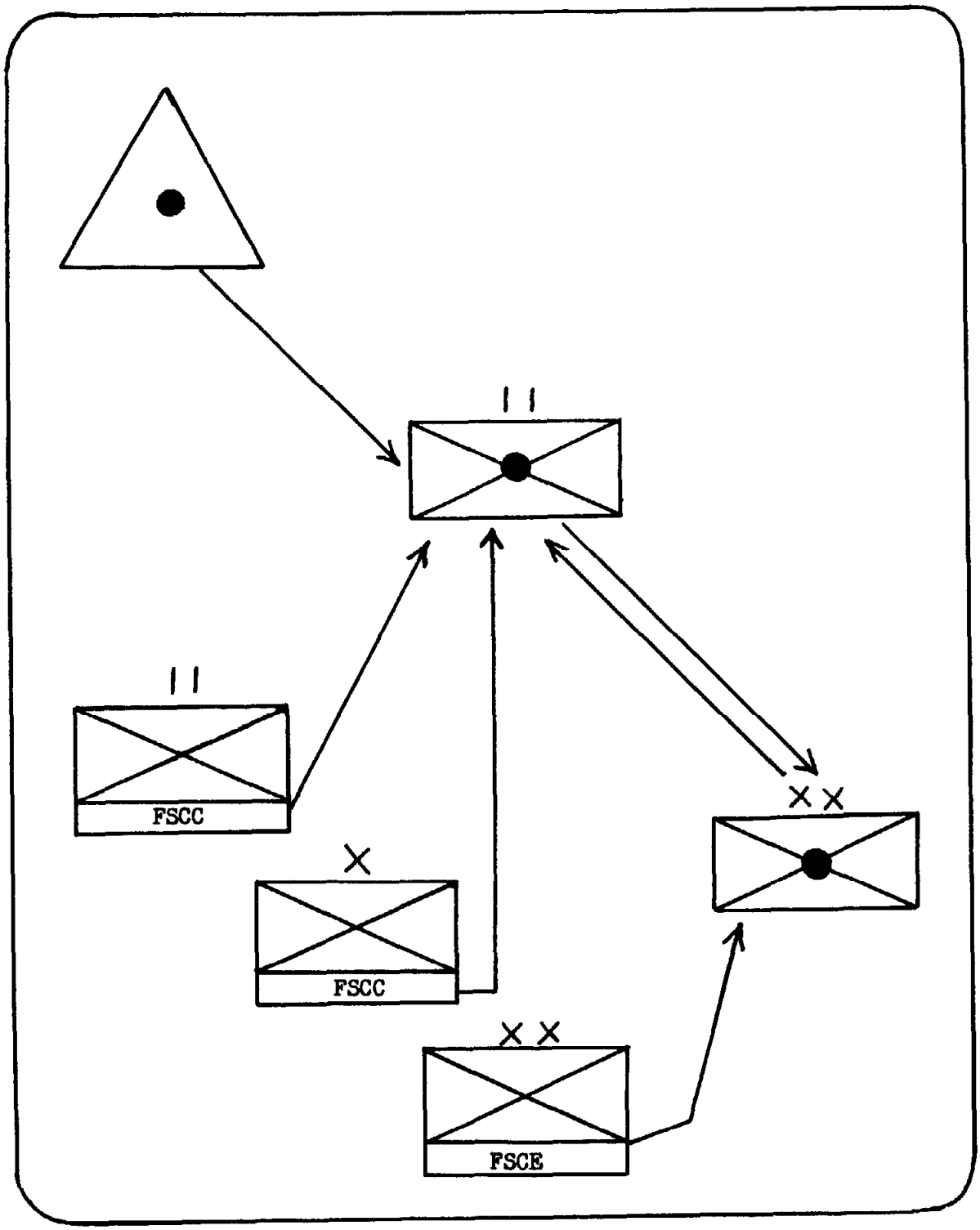


Figure A-7
Artillery Fire Request Channels, DS Battalion

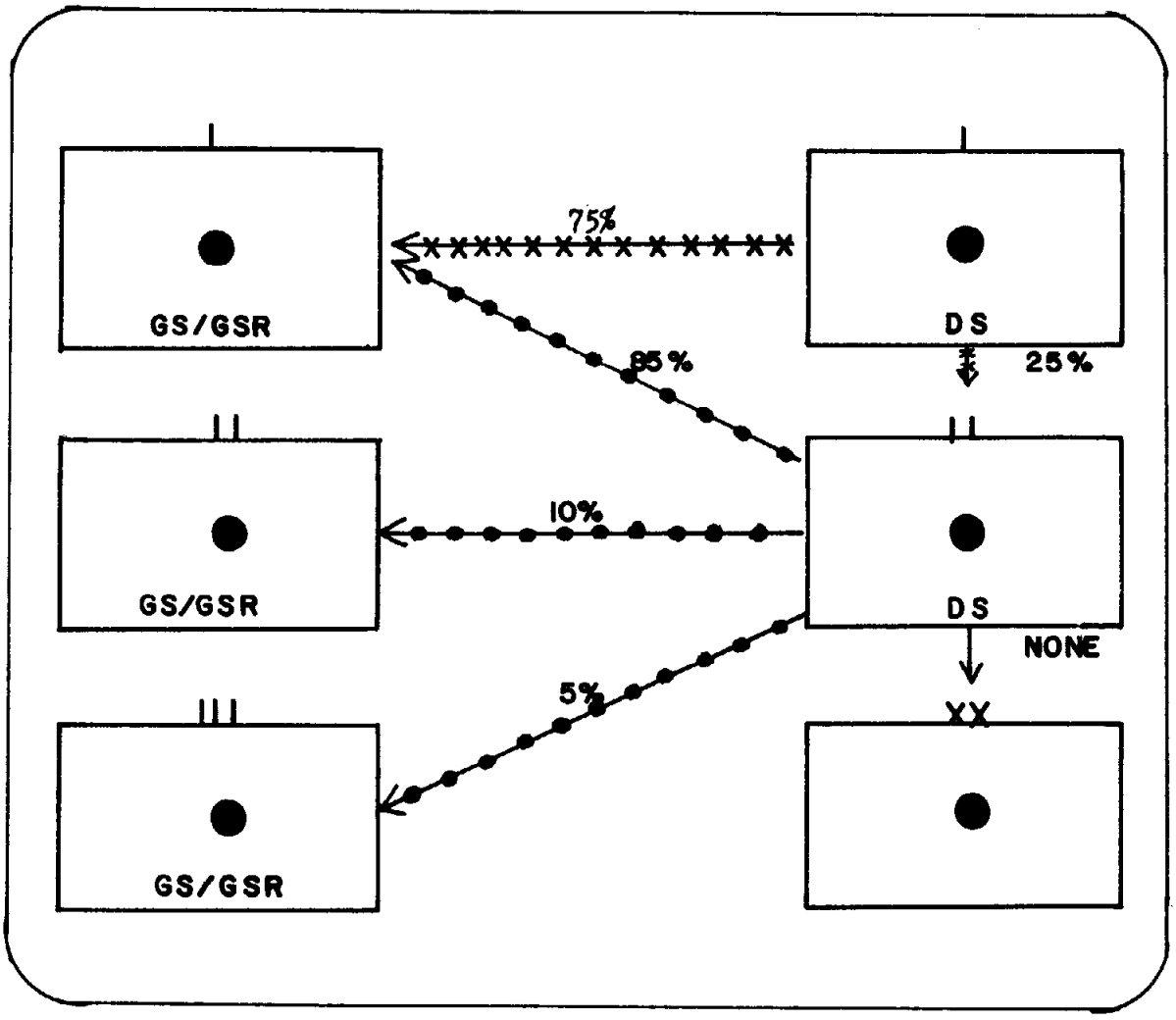


Figure A-8

Modified Artillery Fire Request Channels
Divisional to Group Artillery Units

the functions are the same - to advise aircraft of indirect fires. (See Figure A-9.)

(2) Except when troops are in contact, firing data is posted with the responsible air advisory before fires are delivered into, out of, or across the air advisory's area of responsibility, which normally conforms to RVN political boundaries or to tactical AOs. Aircraft entering the area check in for clearance; they are given either the locations of all fires or a safe route to travel. Aircraft operating in the area are notified of fires by monitoring the air advisory net. Data on fires is given in the clear and usually consists of grid from, grid to, maximum ordinate, and the direction in degrees.

h. Artillery in Populated Areas. Areas populated by friendly civilians create conditions not experienced in previous wars. Populated areas are essentially no-fire zones. Fires near or into these zones require rigid controls and special clearances. (See Figure A-9.) Some of the effects are -

(1) Populated areas complicate the coordination of artillery fires, especially HE and illumination. In many cases, both HE and illumination are precluded, restricted, or delayed to such an extent that their value is greatly reduced.

(2) Maintaining current and accurate population overlays is a continuing problem. In most cases, they are obtained from province HQ and are no more accurate than the province map. The constant shifting of population further compounds the problem.

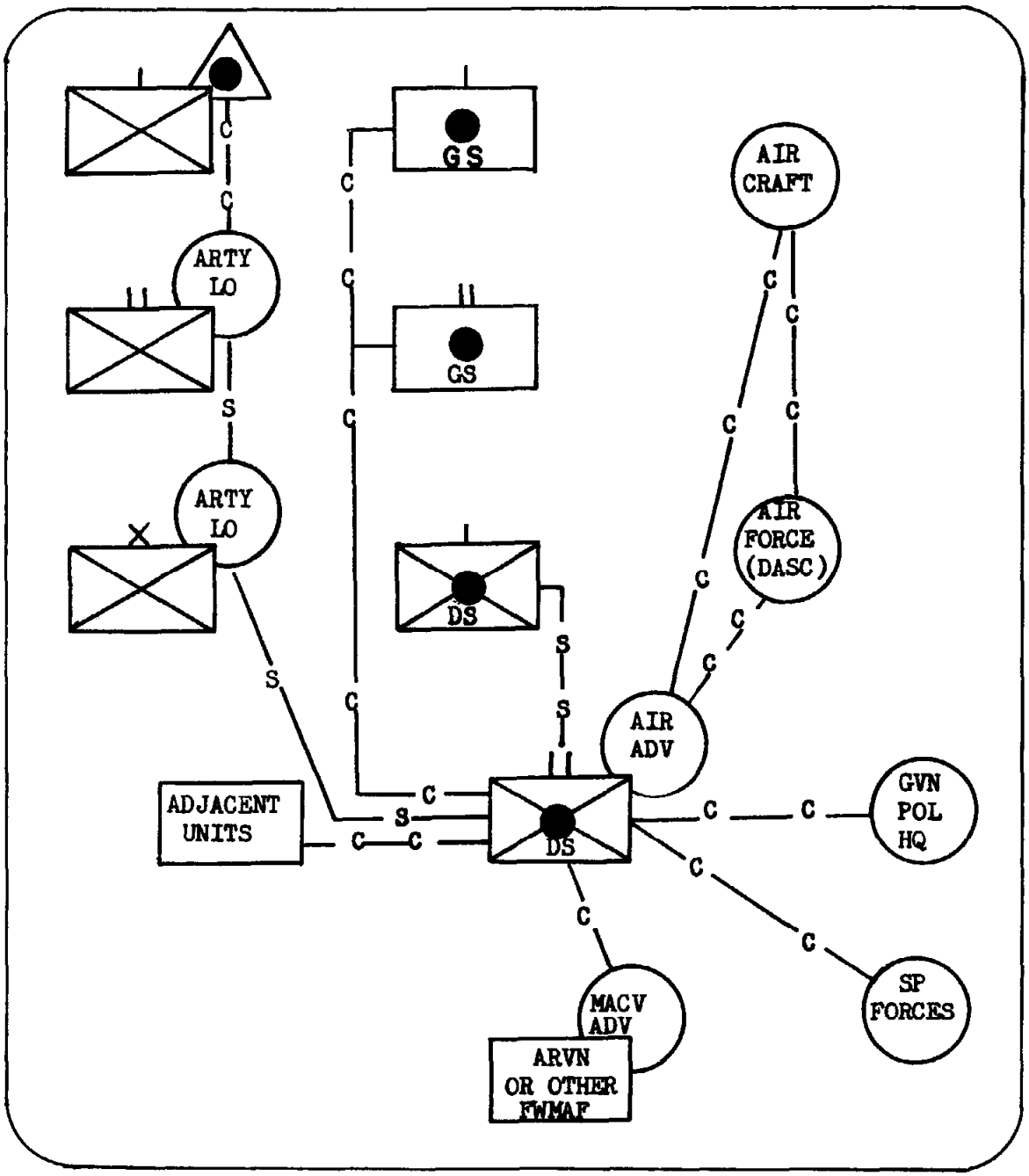
(3) The enemy, realizing that fire cannot be rapidly placed on or near populated areas, uses them as sites for rocket and mortar attacks.

(4) The dangers from the falling baseplate, burning flares, and empty shell impact limit the use of illumination over or near populated areas.

5. SUMMARY OF FA SUPPORT.

a. The ground commander in the RVN has more firepower available to him than in any previous war. It can be delivered accurately and rapidly on almost any point desired by the ground commander.

b. The principles of artillery employment are the same as they have been for years, but many new techniques are being used in the RVN. As infantry operations are characterized by large AOs, numerous movement, violent actions of short duration, and an almost complete



—S —S —S— Secure radio channels

—C —C —C— Insecure radio channels

Figure A-9

Typical Clearance and Air Advisory Radio Nets

absence of front and rear, artillery supporting the operations is less centrally controlled than in a conventional situation.

c. The principles and techniques of fire control and FSC remain valid in the RVN but the environment makes the job of the fire direction officer and the FSCOORD more difficult and exacting than ever before. In World War II and Korea, gunnery errors, e.g., 10 and 100 mil errors, seldom resulted in friendly casualties. (Any round that cleared friendly lines was considered a good round.) In the RVN, about 50% of all artillery missions are fired toward friendly troops or into an area virtually surrounded by converging forces. Any error (over, short, left, or right) may result in friendly casualties.

d. The LO from the DS artillery battalion to the supported infantry battalion, functioning as the infantry battalion commander's FSCOORD, has a particularly vital role in coordination of artillery support. If any single artillery job can be classified as the most important, it is that of the FSCOORD at any level. The normal tasks, plus the tasks of airspace management and control, the distances involved in operations, the frequency of operations, and the speed with which operations are conducted, demand competent individuals in the FSC agencies.

e. Mastering fire control and coordination is one of the most important challenges faced by commanders and staff officers in the RVN. Effective use of the experts (the FOs, LOs, FDC personnel, and FSCOORDs) is a must to insure proper, safe, and effective use of artillery.

ANNEX B

ARMED HELICOPTER SUPPORT

1. INTRODUCTION. As with other types of fire support, the mission of armed helicopters is to support the ground commander in combat. Helicopter operations are not ends in themselves, but must all be keyed to provide the best possible support for the ground forces.

2. DEFINITIONS.

a. Aerial Rocket Artillery. Those armed helicopters within the aerial artillery batteries of the aerial artillery battalion organic to the airmobile division artillery.

b. Armed Helicopter (Gunship). A helicopter equipped with an attached weapons system which is fired by the pilot or co-pilot. The presence of machine guns and door gunners aboard helicopters for defense and security does not constitute an armed helicopter (gunship).

c. Armed Escort. Accompanying armed helicopters used for escorting other helicopters, ground convoys, or for protection of personnel and equipment of damaged aircraft.

d. Heavy Fire Team. Three armed helicopters operating as a tactical element.

e. Lift Helicopter (Slick). A helicopter used for lifting troops and/or cargo.

f. Light Fire Team. Two armed helicopters operating as a tactical element.

3. SOURCES OF ARMED HELICOPTER SUPPORT.

a. Armed helicopter support for the ground commander may come from several organic sources.

(1) Airmobile divisions -

(a) The aerial weapons company of the assault helicopter battalion.

(b) The air cavalry troops of the cavalry squadron.

(c) The aerial artillery batteries of the aerial artillery battalion organic to division artillery.

(2) Infantry divisions -

(a) The aviation GS company of the aviation battalion.

(b) The air cavalry troop of the armored cavalry squadron.

(3) The air cavalry troop of the armored cavalry regiment.

b. Non-organic sources of armed helicopter support include:

(1) Separate armored cavalry squadrons.

(2) Various units, such as assault helicopter companies, aviation companies (escort), and aerial weapons companies of the 1st USA Aviation Brigade. These units are normally under operational control of XXIV Corps, I FFORCEV, II FFORCEV, or DMAC.

c. Although local procedures may vary, aerial rocket artillery support is normally requested through artillery channels while other armed helicopter support is requested through command channels. Armed helicopter support is usually in the form of a "package" of air assets, e.g., one light fire team and one heavy fire team, allocated for a specific period of time.

4. AIRCRAFT AND ARMAMENT.

a. Aircraft. The following are the armed helicopters now in use in the RVN:

(1) The UH-1B and UH-1C are utility helicopters equipped with armament systems which provide accurate and variable firepower.

(2) The AH-1G is the "Huey Cobra", a high-speed, tandem-seated attack helicopter having a fully integrated weapons system, coupled with wing-stored armament.

b. Armament. Any of several armament systems may be found on armed helicopters in the RVN.

(1) The M-5 system is a fully automatic 40mm grenade launcher flexibly mounted in the nose of the helicopter. The gun has a maximum rate of fire of 220-240 rounds per minute and an effective range of 1,200 meters. The system is reliable, accurate, and very effective against personnel. Most ships mounting the M-5 system also have a 2.75" rocket system for added firepower.

(2) The XM-21 system consists of a 7.62mm externally-mounted minigun and a seven-round rocket pod on each side. Each

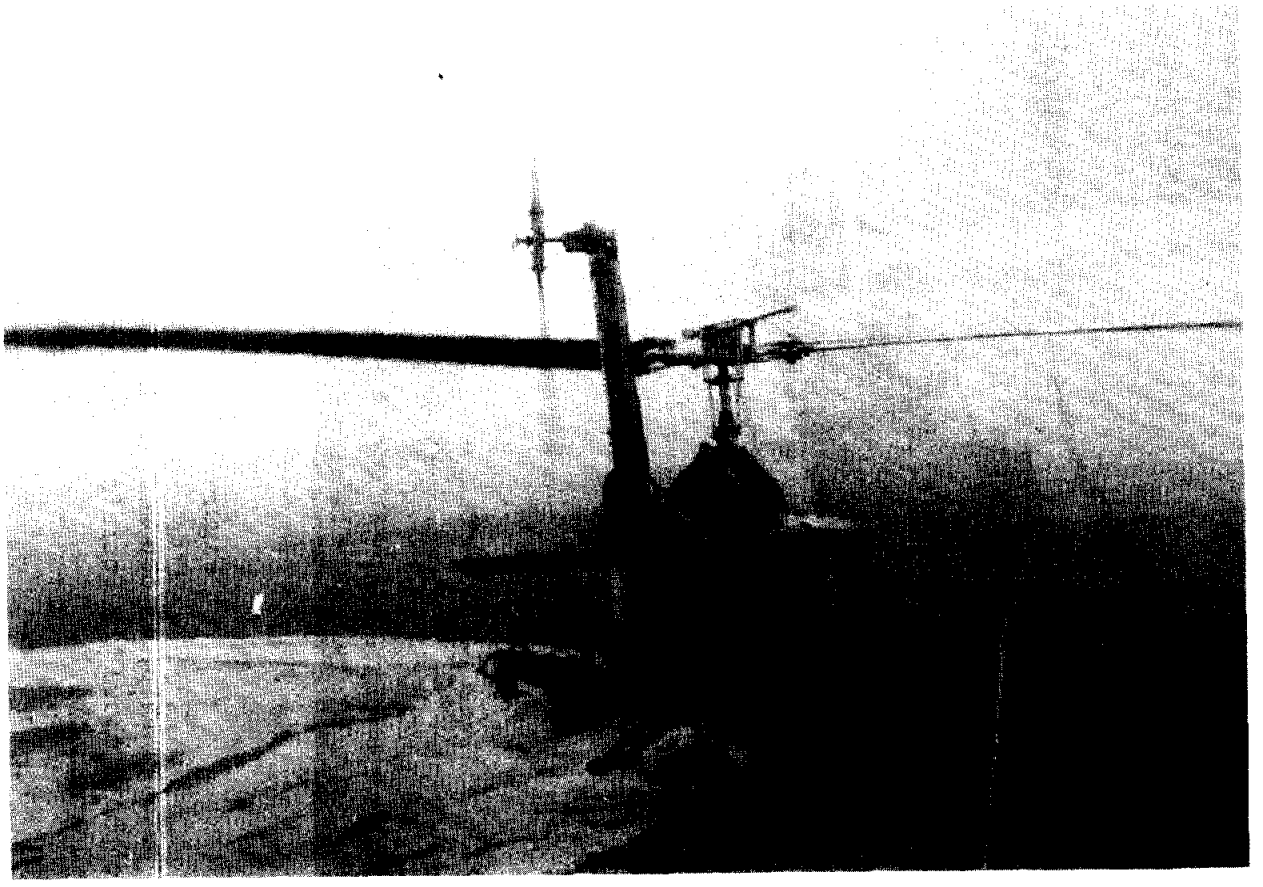


Figure B-1

Rear view of the UH-1 mounting the XM-21 armament system

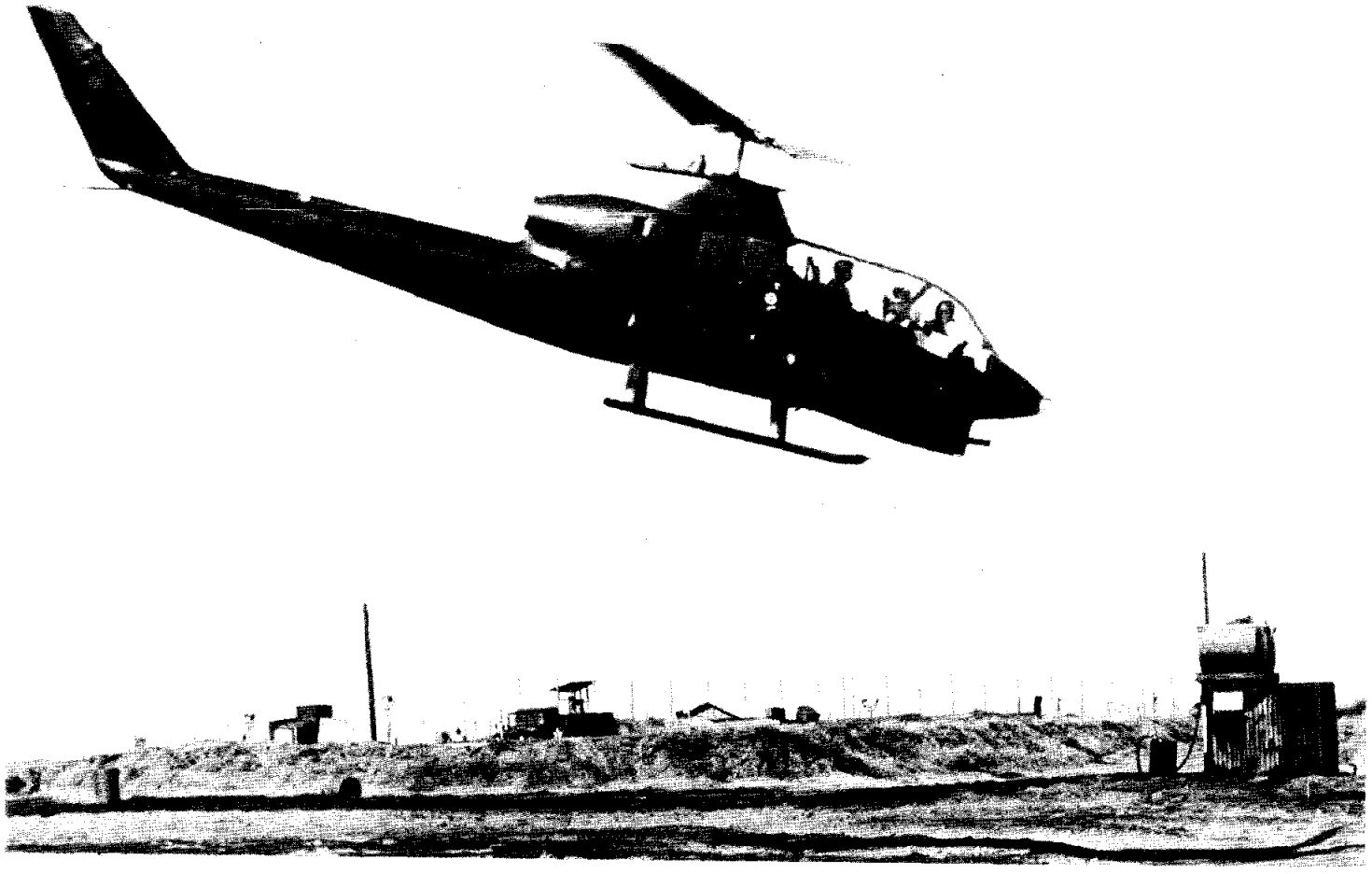


Figure B-2

The AH-1G was designed purely as a gunship, as opposed to the UH-1 which was originally developed as a utility helicopter. This photo shows the Cobra's characteristic profile and the location of its nose turret and wing-stored armament.

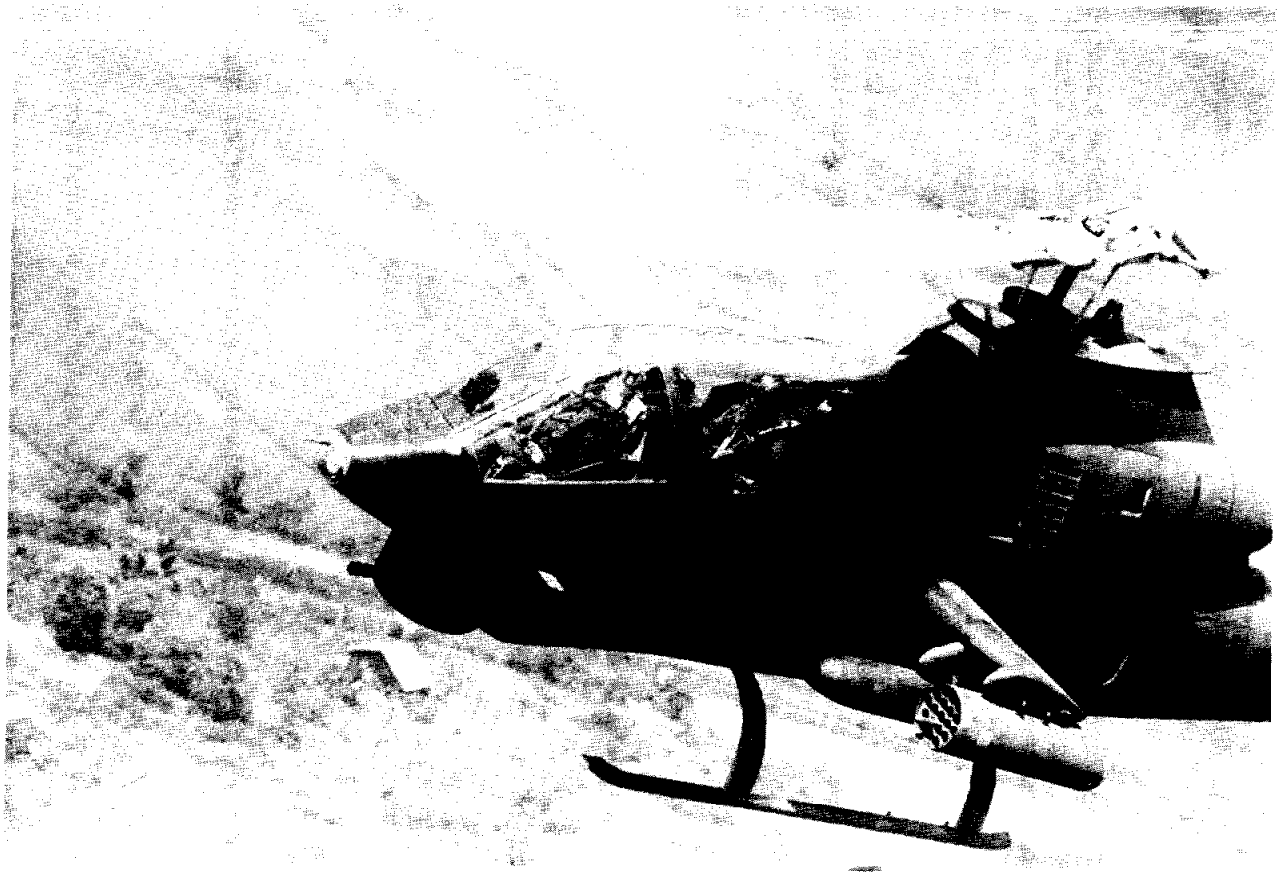


Figure B-3

The AH-1G is designed for a crew of two; the aircraft commander/pilot sits above and behind the co-pilot/gunner. This Cobra is armed with the TAT 102A 7.62mm system in the turret, the XM-18 7.62mm system inboard on the wing, and the XM-159 2.75" rocket system outboard. The TAT 102A system shown here is being replaced by the XM-28 system.

gun can fire 2,400 rounds per minute; there is a three second maximum firing time with a momentary delay between firings.

(3) The XM-18 system is, at present, mounted only on the AH-1G. It is a 7.62mm electrically-fired weapon, with one pod mounted on the inboard store of each wing. The rate of fire is 4,000 rounds per minute.

(4) The XM-157, XM-158, and XM-159 are 2.75" FFAR rocket launcher systems. The XM-157 and XM-159 systems are 7 and 19-tube pods respectively, used only on the AH-1G; the XM-158 is also a 7-tube pod, but it is not adaptable to the AH-1G aircraft.

(5) The XM-35 system is a 20mm cannon kit that can be mounted on the left inboard wing of the AH-1G. The weapon, the XM-195 20mm cannon, has a fixed elevation and azimuth and the pilot maneuvers the aircraft to adjust the strike of the rounds by use of the XM-73 sight. The co-pilot/gunner can also fire the weapon but has no sight. The system carries 950 rounds and can fire 750 rounds per minute.

(6) The XM-28 system is a twin-gun nose turret used on the AH-1G. The system is comprised of any one of the following combinations of weapons:

(a) One 7.62mm machine gun and one 40mm grenade launcher.

(b) Two 7.62mm machine guns.

(c) Two 40mm grenade launchers.

The XM-28 system is usually controlled by the co-pilot/gunner through a floor-mounted sighting station, but can be fired by the pilot in the stowed position.

c. General Capabilities and Limitations. In addition to the inherent capabilities and limitations of helicopters as a class, armed helicopters have the following:

(1) Capabilities.

(a) Rapid delivery of relatively large volumes of fire on point or area targets.

(b) Selective fires on point targets.

(c) A wide assortment and flexible use of munitions.

(d) Responsiveness to changing missions or situations.

(2) Limitations.

(a) Night and weather - The pilot must be able to see the target.

(b) Range and payload - Range or time on station, or both, must be reduced to obtain greater payload.

(c) Crew on the AH-1G - The crew consists of two, the pilot and the co-pilot/gunner. Rearming and refueling require a ground service crew for minimum turn-around time. The small crew also makes VR missions less effective.

d. Helicopter Gunnery.

(1) It is a truism that effective armed helicopter gunnery is achieved only by crews who are knowledgeable, trained, alert, and properly motivated. Effective gunnery is a team effort. Teamwork must be developed within each aircraft crew, between aircraft crews in the fire team, between fire teams in the platoon, between the armed platoon and the lift aircraft, and between the armed platoon and the supported ground forces.

(2) Armed helicopters operate at or near maximum weight limitations. Weight must be a constant consideration. In many cases, it will be necessary to reduce ammunition or fuel, or both, to accomplish a mission. The helicopter is an especially agile but a relatively unstable gun platform.

(3) Probably no single factor, with the possible exception of gunner proficiency, contributes more to the accuracy of helicopter gunnery than proper bore sighting of the weapons. Since most weapons systems consist of multiple guns/rocket launchers, each gun/launcher must be individually adjusted so that the axis of its bore is parallel to the axis of the sight.

(a) Rockets are fired, normally in one or more pairs, by the pilot, who must aim them by aiming the entire aircraft at the target. Helicopter gunnery is extremely complex and will not be treated in detail here. Some 10-12 interrelated factors affect rocket gunnery. Of these, probably the most important single one is the proper alignment of the aircraft, and therefore the rocket system, into the relative wind; if rockets are fired when the aircraft is not properly streamlined into the relative wind, accuracy will be seriously degraded.

(b) The 2.75" rocket warheads available include the ten and 17 pound HE, the ten pound smoke, and the flechette. Fuzes include both the proximity (VT) and point detonating (PD).

(c) Machine gun techniques have been developed and proved over years of experience. These flexible systems, when properly used, are highly accurate throughout their limits of travel. Deflection and elevation angles change constantly throughout the firing run; the co-pilot/gunner must determine the lead or lag for targets at varying angles from the line of flight and for varying ranges and airspeeds. The necessary lead or lag is learned only through experience and practice.

(d) The velocity of the 40mm round is relatively slow, making still different gunnery techniques applicable for this system. A satisfactory degree of accuracy can easily be obtained with practice.

(4) There are few "iron clad" gunnery tactics for helicopters. Tactics and techniques are basically applications of common sense principles and a thorough understanding of the aircraft and it weapons. Variables such as mission, enemy situation, terrain, and equipment affect gunnery tactics. Helicopter fires can generally be catagorized into two types - point fires and areas fires.

(a) Point target fires are directed at a specific point with the intent to destroy the target. The two methods used to engage point targets are diving fire and low-level,or running, fire. Diving fire has the advantage of producing a relatively small and roughly circular beaten zone and range error; its chief disadvantage is in the increased exposure time to enemy fire. Low-level fire has the advantage of minimum exposure time, provided the enemy is confined to the area of the point target and not deployed along the approach route. The chief disadvantage is that the pilot and gunner have minimum time to acquire the target and fire, plus the larger probability of the range error.

(b) Area fires are directed at less restricted strike zones in which specific targets have not been identified; these fires, in LZs for example, are intended more for supression than for destruction. Area fires may be delivered by diving, low-level, or even hovering/stationary modes as the situation demands. Hovering/stationary fires produce a highly elongated beaten zone and do not significantly increase weapons accuracy; with some weapons, e.g., the 2.75" FFAR, the lost accuracy causes this firing mode to be impractical.

5. ARMED HELICOPTER MISSIONS.

a. Mission. The armed helicopter was conceived to increase the fire support available to the ground commander. The mission of armed helicopter units is to provide security for airmobile forces and to engage in offensive, defensive, and delaying actions as part of a highly mobile combined arms team.

b. Operational Missions. Typical operational missions which armed helicopters may perform in support of the ground commander are escort, recon and security, and fire support. Each is discussed further below.

(1) Escort missions may be further classified as aerial escort (for lift helicopter formations) and ground escort (for vehicle convoys).

(a) The aerial escort mission is most common and may be carried out in a variety of ways. The fire teams may fly on the flanks or slightly ahead of the lift formation and may be at various altitudes. Flying at low level, the armed helicopters have the advantage of surprise and better observation; however, low-level flight is not always the best choice. While escorting lift formations, the mission of the armed helicopters is to supress or neutralize ground fire to allow the lift formation to pass through the danger area. Destruction of enemy positions or troops, while a desirable bonus, is not required by the escort mission. There is no requirement for escort when a lift formation is flown at altitudes high enough to avoid ground fire; in such cases, the armed helicopters should escort only at critical points en route, on approach to the LZ, while on the LZ, and on leaving the LZ.

(b) During ground escort, the armed helicopters' mission is to provide for the uninterrupted movement of the convoy and to provide early warning of possible ambush or attack.

(2) The armed helicopter is well suited for recon and security missions. The aerial platform provides excellent observation and mobility to cover relatively large areas quickly. The armament systems provide the necessary means for recon by fire and enough firepower to engage targets effectively.

(3) Fire Support.

(a) The fires of armed helicopters may be integrated into the fire plan of the ground commander along with organic weapons, artillery, NGFS (if available), and TACAIR support; in some cases it may be the only non-organic fire support available. The responsiveness of armed helicopters to the ground commander's needs is one of their principal advantages. In certain situations they can be on target more quickly than any other form of supporting fire.

1 Point target fires are much more effective and should be preferred when specific targets can be identified. The most effective way to achieve point target accuracy is to maneuver the aircraft as close to the target as possible before firing, but this has obvious drawbacks and is not always recommended.

2 Point target accuracy cannot usually be achieved at stand-off distances. Firing from beyond effective small arms range to reduce danger to the aircraft will almost always result in area fires. Point target fires are possible only with well trained and knowledgeable gunners using properly installed and bore sighted weapons; this is especially true with rockets.

(b) Close-in protective fires are possible in support of friendly troops provided -

1 The air crew is familiar with the tactical situation.

2 The air crew has positively identified the friendly positions.

3 The air crew has radio contact with the friendly force.

4 Point target firing methods are used. The inaccuracy of area fires, compared to point target fires, tends to restrict their use in close support of friendly forces.

(c) The friendly force must always mark its forward elements or perimeter by some means identifiable from the air. All participants must understand all prearranged signals for such marking.

(d) Close Fire Support Techniques.

1 When providing close fire support, armed helicopters will break from a firing run toward the fiendly positions whenever possible; this will give the co-pilot/gunner a small safety zone if the pilot should make an abrupt maneuver during a break. Any deviation of the fire from the target because of the helicopter maneuver will go into or beyond the enemy position; if the break were in the other direction, the fire might be directed into the friendly position. Also, since the break puts a helicopter in a more vulnerable position, a forced landing in a friendly position is much more desirable.

2 Another technique to avoid firing into friendly positions is to make a firing run close in and parallel to the friendly position.

3 If no other direction is possible, the firing run may be made over the heads of friendly troops, holding fire until directly above them. This technique has several major disadvantages and should be used only as a last resort. When done, the friendly troops must be advised so that they will not fear that they are being fired upon and will be aware of the possibility of rocket caps and empty cartridge casses falling among them.

4 Close-in support of friendly troops must be carefully coordinated and controlled.

6. SUMMARY OF ARMED HELICOPTER SUPPORT.

a. The armed helicopter has proved invaluable as a fire support means to assist the ground commander in the RVN.

b. As with TACAIR support (Annex C), armed helicopter tactics and techniques in the RVN have evolved in response to, and as permitted by, the environment that exists, i.e., friendly domination of the air. Certain of the tactics and techniques which have been developed and are in widespread use in the RVN would not be feasible if the enemy had his own air capability and more effective air defense weapons.

c. Armed helicopters were conceived to increase the fire support available to the ground commander and their mission is tailored to this concept. Their operations are not ends in themselves, rather they are another means to an end - the success of the ground commander.

ANNEX C

TACTICAL AIR SUPPORT

1. BACKGROUND AND ENVIRONMENT.

a. TACAIR support available to ground commanders in the RVN far exceeds that which has been available in any past conflict in which US forces have been involved. The almost complete lack of sophisticated enemy air defense in the RVN has allowed the use of TACAIR en masse with extreme accuracy. TACAIR aircraft in use in the RVN are provided by the USAF, the USMC, the USN, the Royal Australian AF, and the VNAF. The Commander, 7AF, in his role as single manager for air in the RVN, controls all FWMAF and US TACAIR assets, except those of the USN. The Navy provides 7AF with a daily number of sorties that will be available for commitment and these aircraft are provided to 7AF for employment. The VNAF manages and controls all of its assets. However, US, FWMAF, and VNAF TACAIR assets are all controlled and single managed by a joint combined 7AF/VNAF TACC at Tan Son Nhut Air Base. Figure C-1 shows the deployment and location of facilities which control and direct TACAIR in the RVN.

b. In addition to the CAS provided to ground forces, 7AF conducts a DAS program designed as an interdiction campaign against enemy lines of communication and base areas in the RVN.

c. A most important type of air support, other than TACAIR, in the RVN is the massive B-52 strikes in a saturation bombing role. These B-52 strikes are under the operational control of SAC. The detailed planning of the B-52 strikes is done by SAC representatives at 7AF HQ. The decisions on where to place B-52 strikes are made at MACV.

d. Most TACAIR strikes are controlled by an airborne FAC. In the RVN, the FAC is airborne so that he can see both the target and the strike aircraft. He uses the O-1, O-2A, and OV-10 light aircraft equipped with FM, VHF, and UHF radios and armed with flares and target-marking smoke rockets and smoke grenades. The other method of providing CAS is by the use of radar-controlled all-weather strikes, referred to as Combat Sky Spot. This method can be used under adverse weather conditions and at night and is executed similar to the B-52 strikes, i.e., with no warning to the enemy.

2. THE TACAIR CONTROL SYSTEM.

a. Introduction.

(1) TACS in the RVN is designed for comprehensive and responsive

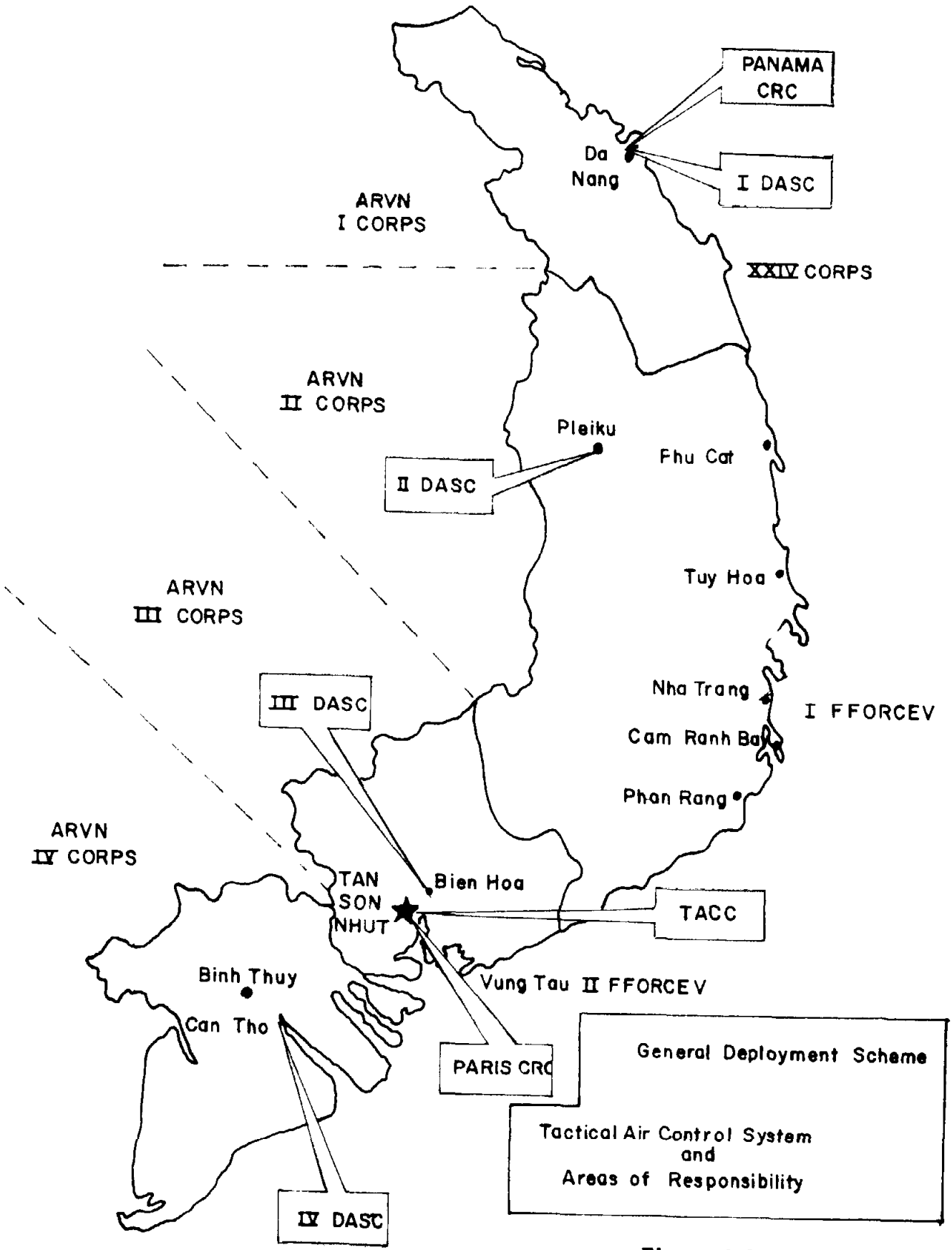

PANAMA
CRC
Da
Nang
I DASC
ARVN
I CORPS
XXIV CORPS
ARVN
II CORPS
Pleiku
Phu Cat
II DASC
Tuy Hoa
ARVN
III CORPS
Nha Trang
III DASC
I FFORCEV
Cam Ranh Bay
Phan Rang
ARVN
IV CORPS
TAN
SON
NHUT
Bien Hoa
TACC
Binh Thuy
Vung Tau II FFORCEV
Can Tho
PARIS CRC
General Deployment Scheme
Tactical Air Control System
and
Areas of Responsibility
IV DASC

Figure C-1

control of all TACAIR. It is a closely-knit composite of 7AF/VNAF/USMC personnel, equipment, and operations centers. In addition to controlling 7AF, VNAF, and USMC (strike and reconnaissance only) air operations, the TACS coordinates and integrates USN and SAC operations in the RVN.

(2) A separate but allied system, the AAGS, provides for processing preplanned requests for air support and rapid exchange of battle information. The two systems, TACS and AAGS, so parallel each other that there is rapid coordination of all air and ground operations.

b. Organization of the TACS.

(1) The TACS has the characteristic and advantage of flexibility to fit any tactical situation. It provides for centralized direction while still permitting decentralized execution of specific operations. The system has proved its responsiveness to ground commanders; the reaction time to requests for immediate air strikes is usually less than 40 minutes.

(2) The TACS is centered around a joint combined VNAF/USAF/USMC operations center at Tan Son Nhut Air Base, the TACC. (Compare Figures C-1 and C-5 for geographical versus schematic outlines of the TACS.) Its purpose is to coordinate and control the total US and RVN air effort. There are several units and agencies below the TACC level that are involved in daily execution of air-ground operations. The 7AF provides the equipment and the TACP personnel who work closely with ground commanders. The USMC uses its own equipment and personnel. There are four DASCs operationally subordinate to the TACC. Three of them are combined USAF/VNAF centers (I DASC, II DASC, AND III DASC) which support US, FWMAF, and ARVN ground commanders in ARVN I CTZ, II CTZ, and III CTZ. There are no US or FWMAF ground forces supported by US TACAIR in ARVN IV CTZ and IV DASC is entirely under VNAF control.

(3) USAF TACPs, operating under each DASC, are positioned with the ARVN corps, divisions, and regiments and the I and II FFORCEV divisions and brigades, as shown in Figure C-6. The responsibilities and manning of the TACPs vary, depending on the level of assignment. Each TACP includes an ALO and/or FAC, radio operators, FAC aircraft, and a vehicle with UHF, VHF, FM, and SSB radios.

(4) The USMC provides its own ALOs, TACPs, and FACs to work with its ground units.

(5) Radar coverage is basic to the operation of the TACS. Sites are located throughout the RVN for complete coverage. For radar

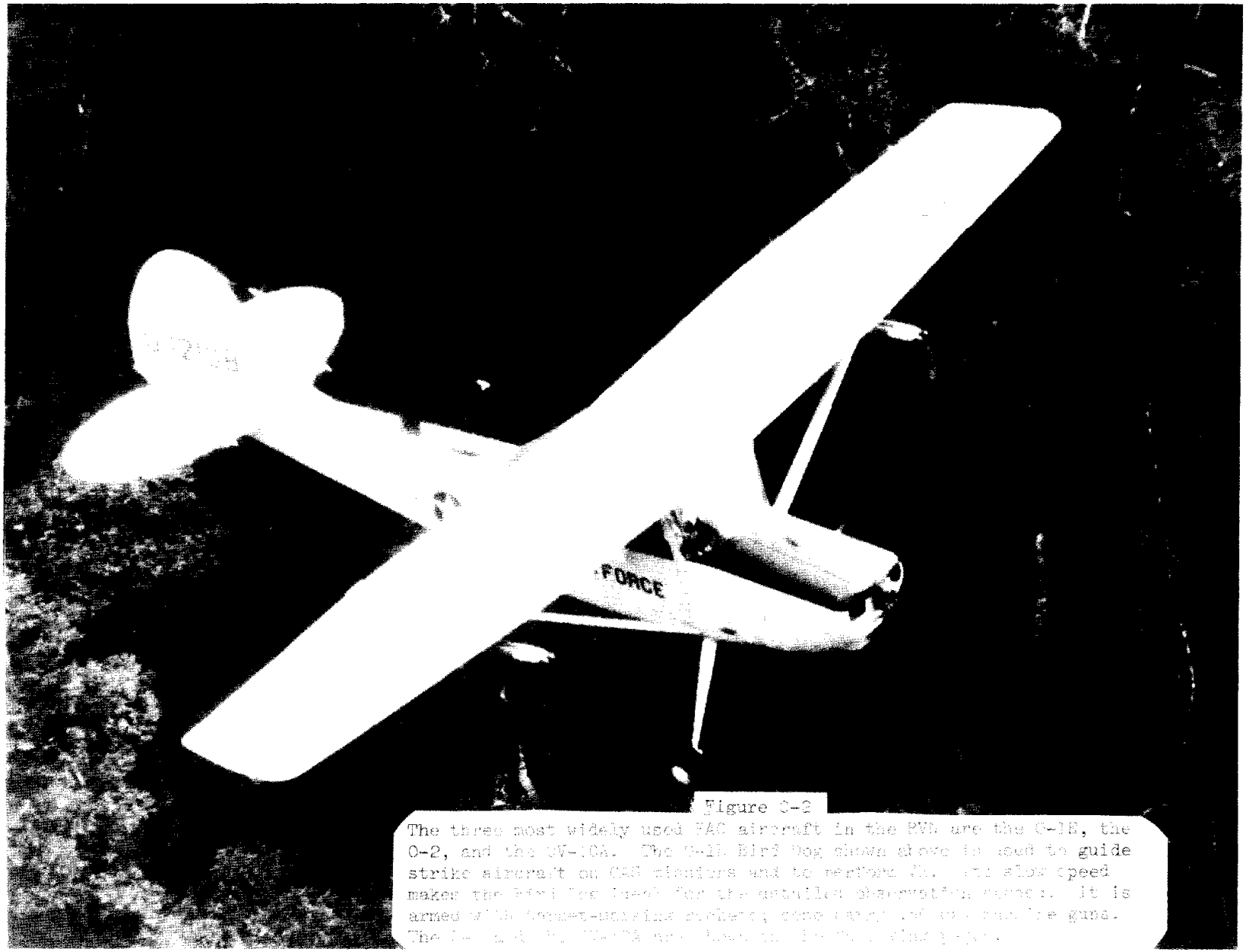


Figure C-2

The three most widely used FAC aircraft in the RVN are the C-IE, the O-2, and the OV-10A. The C-IE Bird Dog shown above is used to guide strike aircraft on CAS missions and to perform FAC [illegible] slow speed makes the Bird Dog ideal for the unskilled observation pilots. It is armed with [illegible] and .50 cal machine guns.

Figure C-3

The O-2 Super Skymaster has two primary functions in the RVN. As the O-2A, it is a FAC aircraft; as the O-2B (above), it is a psychological warfare aircraft. The O-2A has four wing pylons for carrying rockets, flares, and other light conventional ordnance, including a 7.62mm minigun. The O-2B is equipped with an 1,600-watt loud speaker and amplifiers, tape recorders, and leaflet dispensers; it can carry 500,000 leaflets.

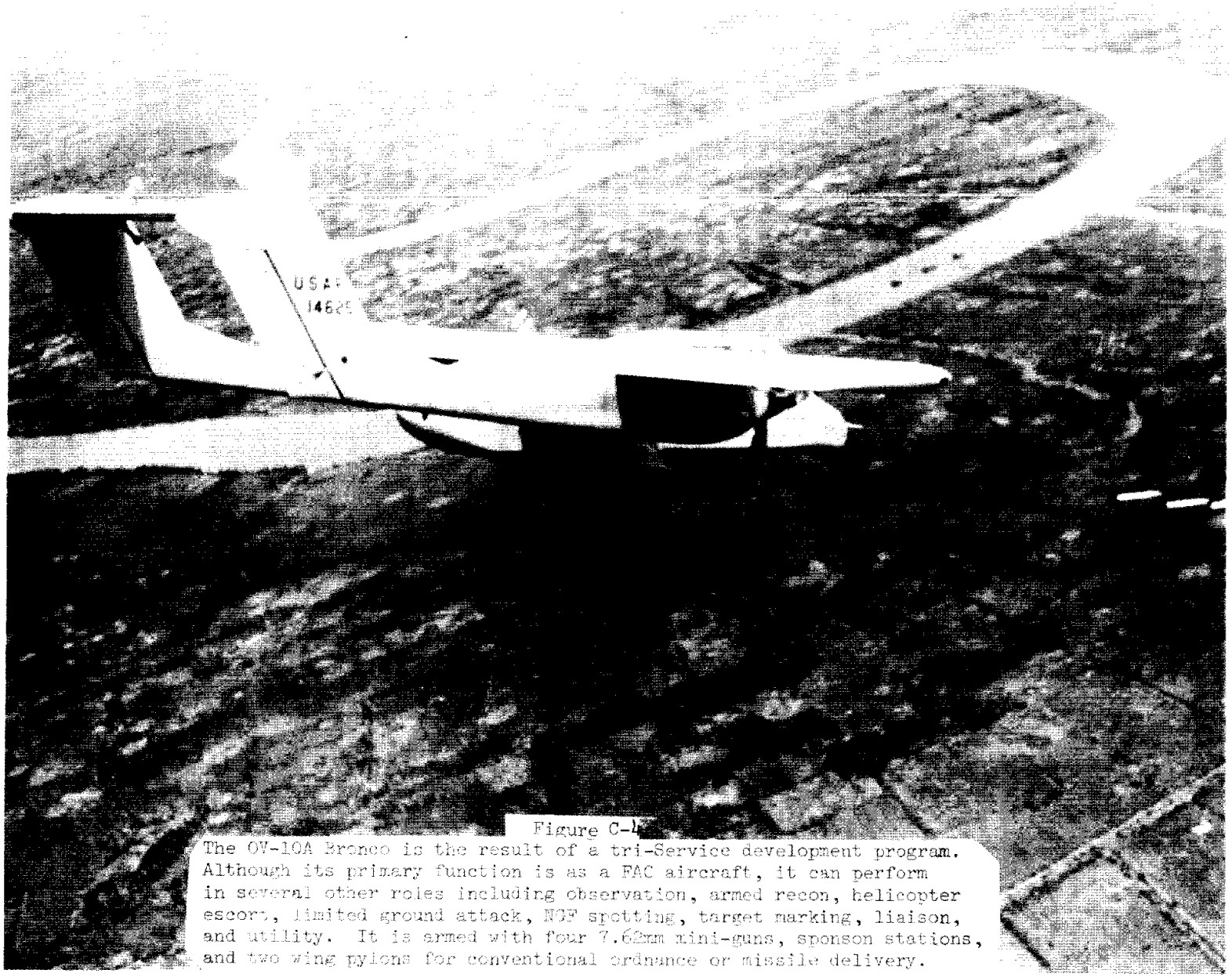


Figure C-4

The OV-10A Bronco is the result of a tri-Service development program. Although its primary function is as a FAC aircraft, it can perform in several other roles including observation, armed recon, helicopter escort, limited ground attack, NGF spotting, target marking, liaison, and utility. It is armed with four 7.62mm mini-guns, sponson stations, and two wing pylons for conventional ordnance or missile delivery.

control purposes, the RVN is divided into two sectors; each sector contains a large high-performance radar at a CRC. Aircraft track data at the CRC is augmented by similar information provided by outlying radars at CRPs. The USMC operates one CRP and several TPQ-10 sites (the USMC equivalent of the USAF MSQ-77 radar bombing equipment).

c. Functions and Operations of the TACC.

(1) The TACC, acting for the 7AF commander in his capacity as MACV Air Force Component Commander and the DEPCOMUSMACV for Air Operations, has responsibility for running the air war in the RVN. The TACC performs several functions:

(a) It plans, directs, and coordinates all US, VNAF, and FWMAF TACAIR operations in the RVN.

(b) It publishes fragmentary (frag) orders to the agencies concerned, including the 1st MAW in I CTZ whose strike and recon aircraft are tasked by the TACC.

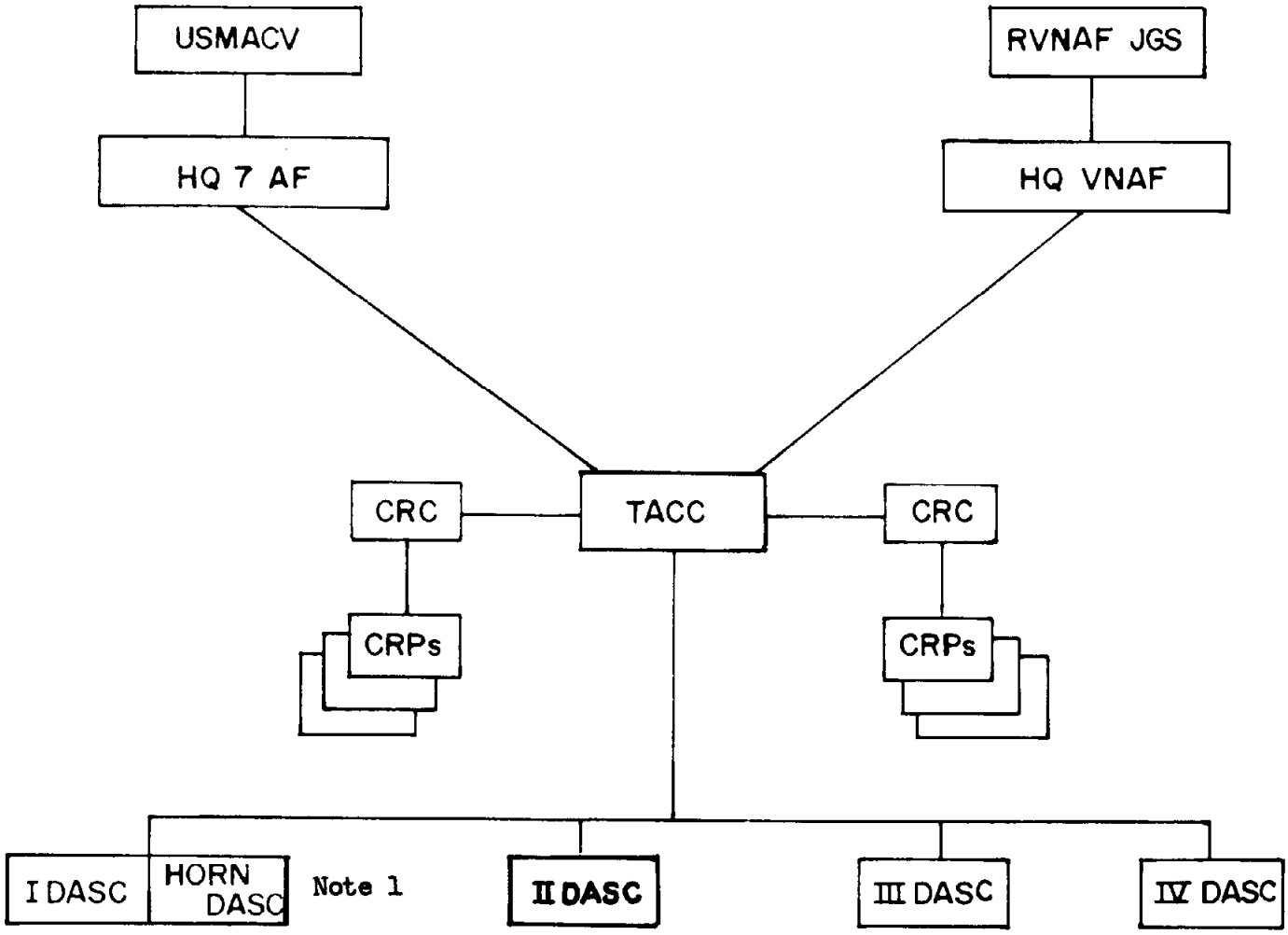
(c) It directs, monitors, and diverts strike aircraft as necessary.

(d) It establishes policies and procedures governing the operation of the TACS.

(2) The four DASCs are operationally subordinate to the TACC and serve primarily as extensions of the TACC. They provide a fast reaction capability to satisfy immediate requests from ground commanders for CAS, TACAIR recon, and emergency airlift (not considered further here). They also provide minute-to-minute coordination between the ground commanders in their area and supporting air elements, not only strike aircraft but recon, herbicide, PSYOP, and B-52 aircraft as well.

(3) To fill an immediate request, the DASC may, with Army/USMC approval, divert TACAIR from preplanned missions enroute to the target. In many cases there will be enough airborne aircraft on missions of lower priority to provide diverts, and these result in a quicker response than scrambled aircraft. With one exception, the DASCs do not have authority to scramble alert aircraft - I DASC is allocated USMC ground-alert aircraft for scramble purposes and need only inform the TACC of their launch. If a DASC cannot fill an immediate request by diverts within its area of responsibility, it will request the TACC to scramble ground-alert aircraft. The TACC may elect to scramble aircraft or to divert strikes from an adjacent CTZ.

TACTICAL AIR CONTROL SYSTEM



Note 1: HORN DASC was deactivated on 15 April 1970.

Figure C-5

(4) The TACP provides an AF communication system down to the brigade level. An ALO, who is a key member of the brigade commander's staff, heads the TACP. The ALO attends the brigade commander's meetings, briefs on air activity in the area of interest, and advises on the use and capabilities of TACAIR. Also, the ALO is a senior FAC and the supervisor of the FACs in his TACP. These FACs are AF pilots who perform several vital missions from their airborne positions in light observation aircraft. The FACs:

(a) Maintain close contact with local ground commanders.

(b) Help keep ground commanders in contact by providing airborne radio relays.

(c) Direct air strikes.

(d) Perform BDA and forward BDA reports.

(e) Perform VR during daily airborne patrols of their sectors.

(5) The radar and extensive communication network of the TACS make possible the quick responsiveness of the system. All aircraft on strike missions are picked up on radar and identification is usually established within five minutes after takeoff. Radar direction is provided to the pilot to the rendezvous point with the FAC. After the strike, radar contact is reestablished with the controlling radar facility for the return to base. Should an aircraft need emergency assistance, the radar network can provide vectors to the nearest suitable base or bailout area. Strike aircraft are also provided inflight radar advice on possible conflicting air traffic and warnings on artillery fires.

3. CLOSE AIR SUPPORT.

a. Introduction. This section will address those CAS missions that are flown in proximity to friendly forces and require integration of the air mission with the fire and maneuver of ground commanders. In the eyes of the ground commander, the most significant of these missions are support of engaged forces, helicopter landing zone preparation, prestrike troop airlift cover, and road convoy escort. Missions for harassment, interdiction, area neutralization, or support of future operations will be included in a later section.

b. Operation of the CAS System.

(1) To furnish the integrated TACAIR support needed daily by ground commanders, CAS missions are provided as either preplanned

ALO/FAC MANNING

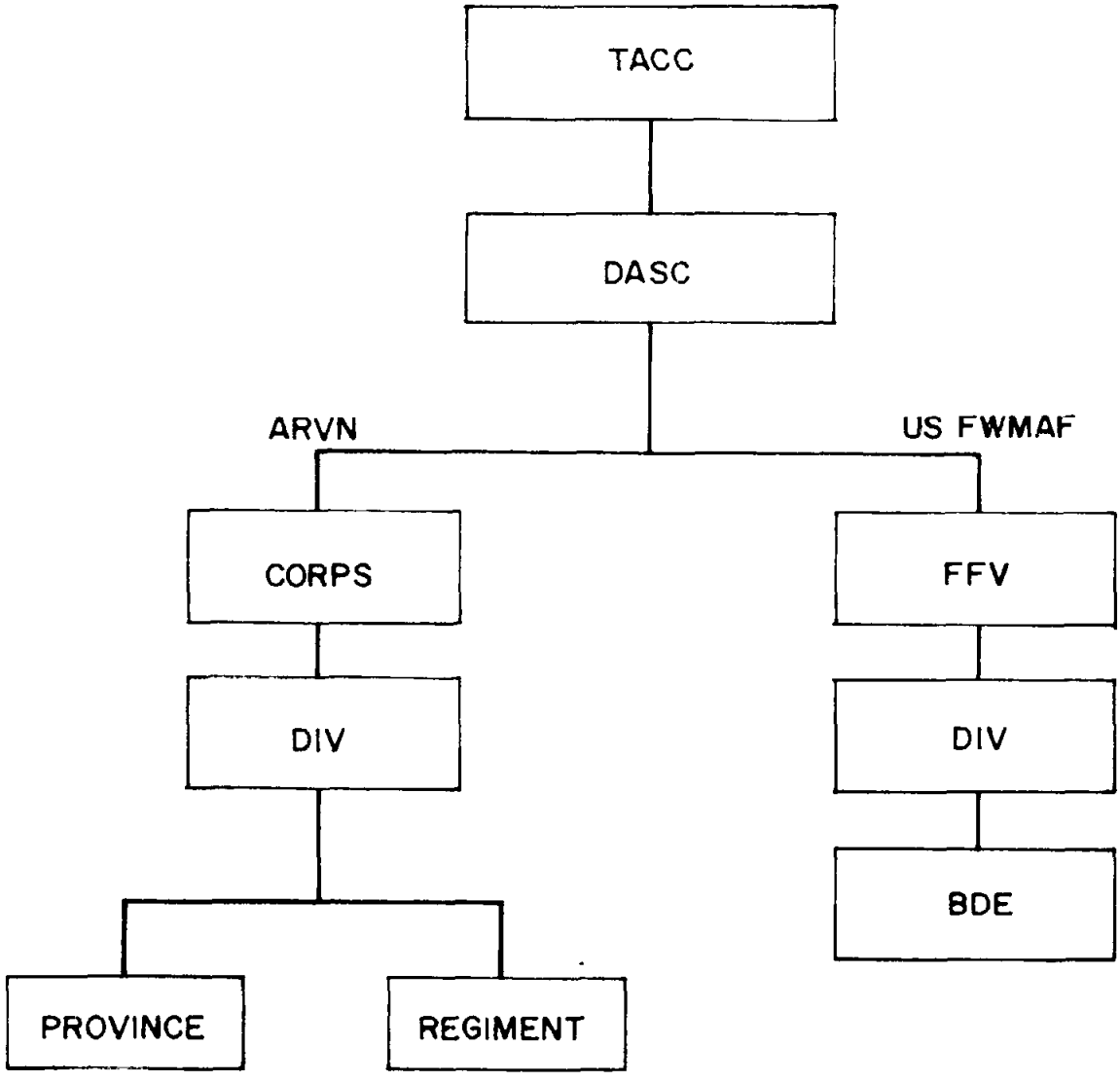


Figure C-6

or immediate. Requests for either type are processed through the JAGOS, as established by MACV, to provide an integrated command and control system. The JAGOS is shown in Figure C-7 and includes the AAGS and the AF TACS. The RVN is blanketed by UHF, VHF, and HF control and reporting nets, land lines, and secure teletype. All secure communications are available from the COC in the TACC to the corps DASCs and down to the ALOs, FACs, strike bases, and radar sites.

(2) Because of intermingling of friendly forces, local population, and enemy forces, all strikes in the RVN must be approved by a province chief or higher RVN authority. For normal US/FWMAF operations, this approval is usually granted in advance to ground commanders for their areas of responsibility. This advance approval helps to minimize delays in processing requests for CAS to engage forces.

(3) There are 8 fighter wing equivalents in the RVN, including the VNAF and USMC units. In addition, there are squadron-size units and USN carriers which have tactical fighters. These wings, squadrons and carriers have A-1, A-4, A-6, A-37, F-4, F-8 and F-100 type aircraft. Typical tasking of these forces has often provided over 300 preplanned sorties daily, plus immediates. Preplanned and immediate sorties typically total over 12,000 monthly in direct support of ground commanders.

c. Preplanned Strikes.

(1) Preplanned requests for TACAIR support originate with the ground commanders, based on their plan of maneuver. Requests may originate at any level, but must be approved up the chain of command to corps level.

(2) The Vietnamese province chief concerned must approve each request. This approval is secured at the division level for requests coming up the AAGS. In many cases, the ground commanders are granted advance approval for a specific area. In the ARVN structure, the province chief examines requests from his various districts and forwards those he approves to corps.

(3) Approved requests for US and FWMAF TACAIR, listed in order of priority, are forwarded by the US advisors to the ARVN Corps, US FFORCEVs, and XXIV Corps to the MACV J-3 TASE in the TACC. The TASE, made up of elements of MACV J-2 and J-3, is staffed with US Army personnel and is the final authority for approving requests and assigning priorities, guided by overall MACV requirements. The TASE is the body through which COMUSMACV approves and assigns priorities to all CAS requests and then levies CAS tasks to be executed by USAF, USMC, and, when available, USN aircraft. The execution of these tasks

MACV

JOINT AIR-GROUND OPERATIONS SYSTEM

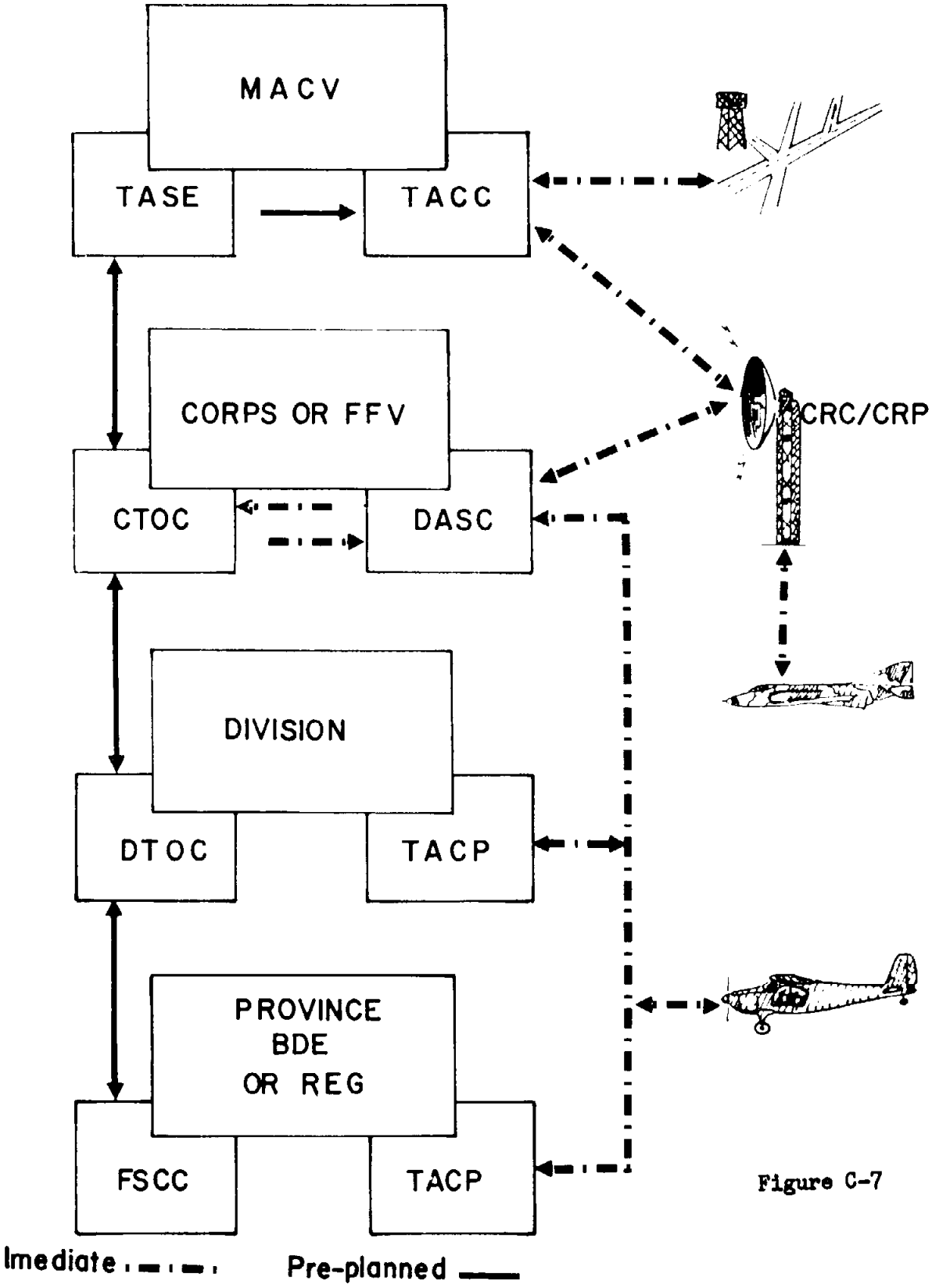


Figure C-7

is planned, directed, and controlled through the TACS, which functions under the supervision of the Commander, 7AF in his capacity as MACV AF Component Commander and as DEPCOMUSMACV for Air Operations.

(4) Those strike requirements recieved by the TASE from ARVN Corps advisors are to fill requirements which the VNAF cannot accomplish. The ARVN corps commanders control the VNAF aircraft in their CTZs and specify which requests will be supported by VNAF aircraft. The VNAF Strike Plans Branch, in the TACC, issues the VNAF frag order for all CTZs.

(5) The targets passed to the TACC by the TASE are a levy to be satisfied within the limits of aircraft available. The requirements are passed to the Strike Plans Branch in the TACC where they are matched with aircraft available for the following day. The strike planners then prepare the frag orders which task the fighter wings with the missions.

d. Typical Preplanned CAS Strike.

(1) A typical Army-requested preplanned strike might start at the battalion level. The brigade is planning a search-and-clear operation and a battalion commander needs an air strike for LZ preparation for a helicopter assault. The brigade ALO has reconnoitered the LZ area to determine the most effective ordnance for the mission. In selecting the ordnance, the ALO considers such factors as the area to be covered, the nature of the terrain, the tree trunk size, and the type and density of the canopy. In some cases, it is the ALO who recommends to the ground commander that an air strike be requested for a specific purpose.

(2) The brigade commander also has several other air strike requests for the following day. For each request, the grid coordinates, desired ordnance, TOT, latest TOT, a brief target description, and desired results are listed. The requests are then numbered in order of priority and sent to division. The division list is passed to FFORCEV, again consolidated with other lists, and sent to the MACV TASE. A TACP is located at the brigade TOC and at each higher TOC. As the request is forwarded, it is examined by the ALO at each level.

(3) The original battalion request for an LZ preparation air strike is still high on the consolidated list sent to the MACV TASE, is approved there, and sent to the TACC, still with a high priority. The request, along with others for the next day, arrives at the Strike Plans Branch of the TACC. The strike planners determine the number and type of aircraft, the ordnance, TOT, and rendezvous point with the FAC for each strike. The Strike Plans Branch then consolidates the preplanned strikes into the daily frag order and sends it to all interested agencies. The DASC passes the information to the division

Figure C-8

When available, USN carrier-based aircraft such as the A-4, the A-6, and the [illegible] support ground commanders in the RVN. This support is coordinated and integrated through the [illegible]. This A-4 Skyraider is based on the [illegible]. The A-6 and the [illegible] are shown on the following pages.

Figure C-9

An A-6 is being catapulted from the deck of the USS CONSTELLATION. The aircraft in the foreground are A-4s.

Figure C-10

Three F-8 Crusaders return from a mission to the USS HANCOCK. The one on the left is an RF-8, configured for aerial recon.

ALOs who radio the targets to the various FACs. In this way, the FAC learns during the early evening what preplanned strikes he will be directing the next day.

(4) The frag is received by the tasked aircraft wings the evening before the strikes and the aircraft are armed with the specified munitions.

(5) On the day of the mission, the FAC takes off, calls the TACP at his takeoff location that he is airborne, and calls the TACP serving the commander who requested the strike to advise him that he is on the way to the target. The FAC also determines if there has been any change in the TOT, grid coordinates, etc. He checks with weather, then calls the AASWCC for information on artillery fire in order to clear himself and to plan a safe approach for the strike aircraft.

(6) He may also call the S-3 Air of the unit requesting the strike for the detailed target description. The original request may have been only in general terms and provided a six-digit (100 m square) grid location. The FAC can place the fire much more precisely if he can get a specific target description, such as, "250 meters north of the white boulder upstream from the fording site." Under NO circumstances, should the numerical grid be given in the clear earlier than one hour before TOT; if possible, not more than 20 minutes before TOT is preferable. In some cases, the FAC may have to be given the call sign and frequency of a company commander far out in the "boonies" to get the detailed target description.

(7) There may be several artillery clearances the FAC has to obtain - division, brigade, and battalion (even two battalions, if the target is less than 1000 meters from the boundary between the battalions). From each of these, the FAC must get friendly locations, confirmation of target grid, and clearance to expend.

(8) Now the FAC is ready to contact the ground commander with whom he will be working. Normally, he is the ground commander of the closest friendlies. The FAC obtains from him the latest location of the closest friendlies, the scheme of maneuver, and specifically what the ground commander wants from the strike aircraft ordnance. The FAC gives him the latest information on when to expect the strike; has him stand by to mark his position; and, if necessary, advises him to have his troops take cover (depending on the ordnance to be used and the distance from the friendlies to the target). The ground commander will appreciate knowing what kind of strike aircraft are on the way, what kind of ordnance they will use, and in what direction they will be working.

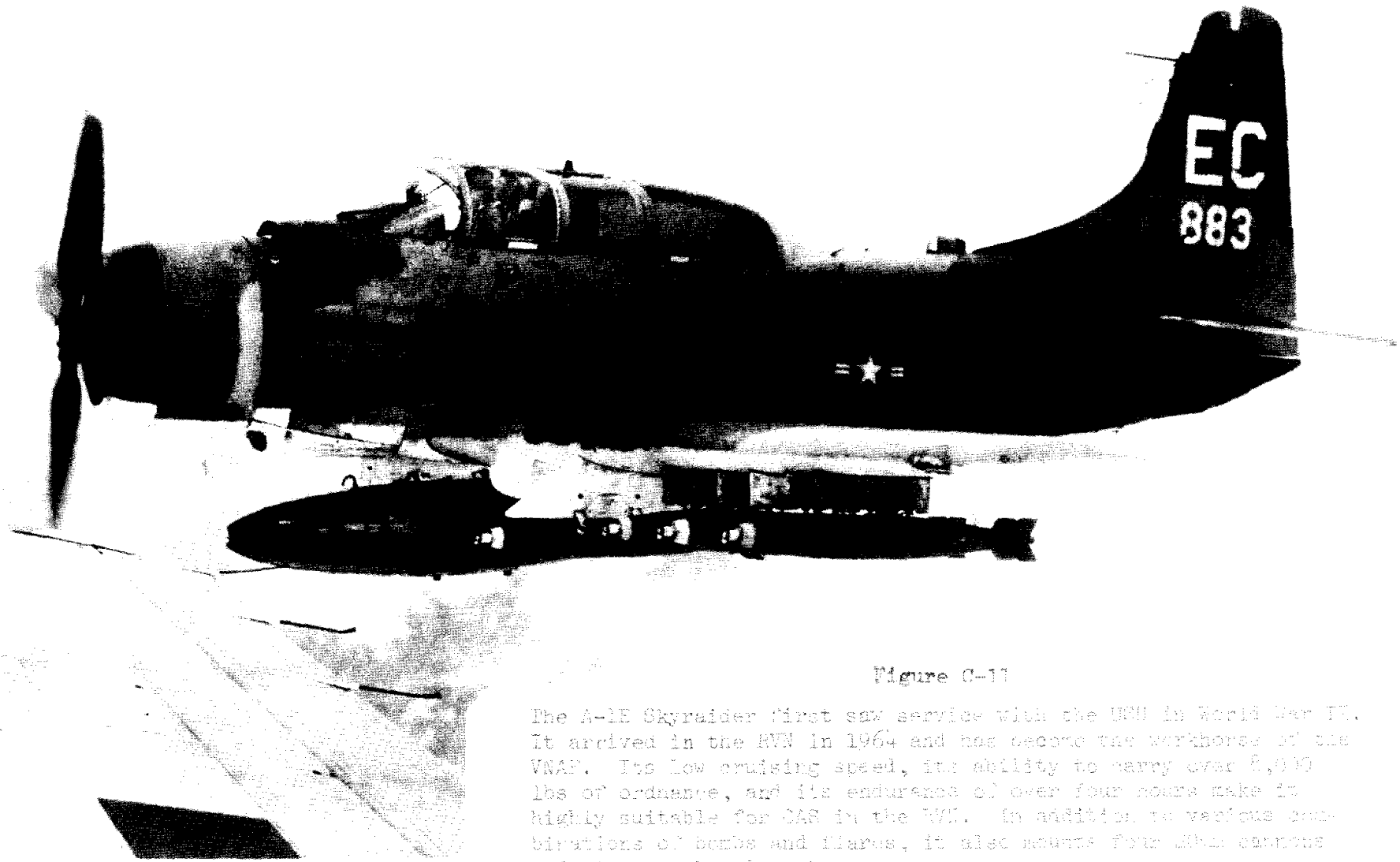


Figure C-11

The A-1E Skyraider first saw service with the USN in World War II. It arrived in the RVN in 1964 and has become the workhorse of the VNAF. Its low cruising speed, its ability to carry over 8,000 lbs of ordnance, and its endurance of over four hours make it highly suitable for CAS in the VNAF. In addition to various combinations of bombs and flares, it also mounts four 20mm cannons and eight rocket launchers.

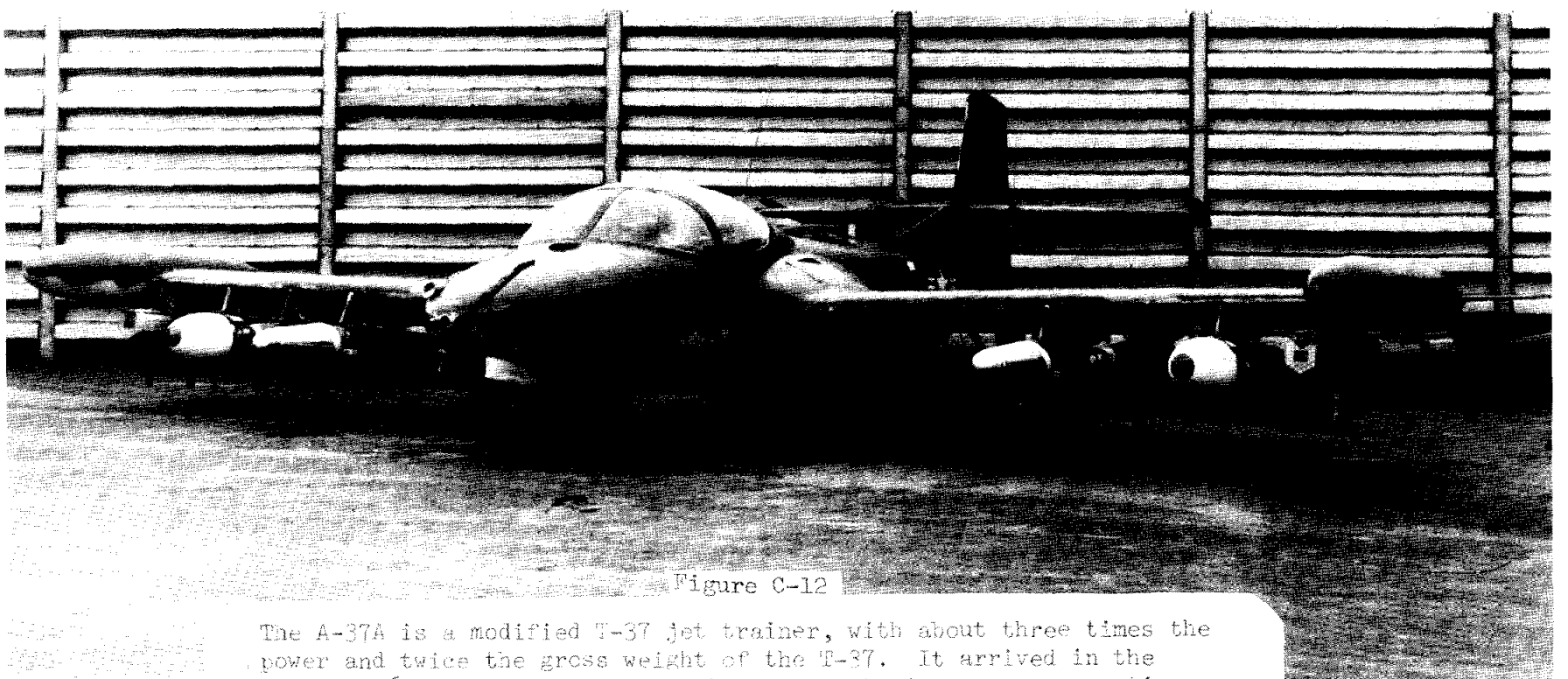


Figure C-12

The A-37A is a modified T-37 jet trainer, with about three times the power and twice the gross weight of the T-37. It arrived in the RVN in 1967, designed specifically for counterinsurgency operations and CAS in SEA. Its maneuverability at a relatively low rocket-firing and strafing speed allows it to "press in" for delivery accuracy. Almost 5,000 lbs of ordnance can be carried on its eight wing pylons, plus one nose-mounted mini-gun.

(9) Sometimes the ground commander will be directing his forces from a helicopter and may want to mark the target himself. In these cases, the airborne ground commander can assess damage between strikes, mark new targets, and assess total damage. The FAC should let the ground commander know on what UHF frequency the strike aircraft will be handled so that he can monitor FAC directions.

(10) Meanwhile, the strike pilots have been briefed on the mission and the weather and have taken off. They are controlled by the CRCs and CRPs until about five minutes before reaching the rendezvous point with the FAC, at which time they switch to the FAC frequency. The FAC insures that he is on the designated frequency 15 minutes or more before the rendezvous time. As soon as he has contacted the strike aircraft he switches them to another frequency. The FAC monitors all his radios - TACP on VHF, strike aircraft on UHF, and ground commander on FM - so that he can receive instruction from various sources to cease fire or change target.

(11) When he contacts the strike aircraft the FAC ascertains their mission number, altitude, position, number of aircraft, amount and types or ordnance, and the maximum time they can remain in the area. He describes the target to the strike pilots, gives them a clear route of approach, and tells them the location of both enemy and friendly troops. He establishes attack and breakoff headings which will prevent overflying friendly troops when delivering ordnance and he determines the sequence of ordnance delivery. This exchange of information between the FAC and pilots is essential to effective delivery of ordnance with minimum risk to the FAC, pilots, and friendly ground forces.

(12) When the strike aircraft are overhead and visual contact is clearly established, the FAC has the ground commander mark his location. When the friendly positions are firmly outlined, the FAC marks the target with his rockets (or clears the ground commander in his helicopter to mark), and clears the strike aircraft in. He transmits specific clearance to expend to each aircraft on each individual pass when he is sure that the aircraft is properly aligned on target.

(13) The FAC must position himself so that he can always see both the strike aircraft and the target. After the first pass, he directs later passes to insure adequate target destruction. One of the most effective methods is to adjust from the last ordnance drop; corrections are given in meters and direction from the last impact. The FAC has the responsibility to approve or disapprove the strike, but this does not relieve the strike pilots of the responsibility to abort the strike if they see a potentially dangerous situation develop.

(14) After expending their ordnance, the strike aircraft hold

Figure C-13

The F-5 Freedom Fighter is a twin turbojet supersonic fighter designed for CAS, interception of enemy fighters, interdiction, and recon. It can carry up to 6,200 lbs of air-to-air and air-to-ground ordnance, extra fuel, or recon and surveillance equipment. Ordnance might include 500, 750, 1,000, or 2,000 lb bombs; Sidewinder or Bullpup missiles; 2.75", 5", or Zuni rockets; napalm canisters; and two 20mm cannons.

Figure C-14

The F-100 Supersabre single engine jet fighter has become a TACAIR workhorse in the RVN. It can carry four 20mm cannon, a full spectrum of conventional bombs, and a combination of missiles. The versatility of weapons makes the F-100 well suited for CAS of ground units in the RVN.

"high and dry" out of enemy range and receive a BDA report from the FAC. When released by the FAC, the strike flight forms and leaves the FAC frequency to re-establish radar contact for the flight to home base. Upon return to base, the pilots go directly to an intelligence debriefing to relate information on type target, tactics used, ground fire recieved, BDA, and other significant data. The FAC passes BDA to the TACP associated with the ground commander supported. This TACP passes the BDA to the DASC who routes it to 7AF intelligence. (See Figures C-15 and C-16 and Appendix 1 for more information on preplanned strike procedures.)

e. Immediate Strikes.

(1) It is not possible for the ground commander to know precisely how the battle will evolve or when he may meet unexpected opposition. Thus, there is another type requirement for CAS - the immediate strike requirement. The same basic approval process takes place for immediate requests as for preplanned ones, except that it is at a much more rapid pace.

(2) Immediate requests are sent through the AF request net directly to the DASC, as shown in Figure C-17. Each higher level of the Army command monitors these requests thorugh its respective TACP, remaining silent if the request is approved. If the request can be satisfied by weapons available to a higher commander, the request is disapproved and the requesting commander is advised of the support to be furnished. When an immediate strike is requested by RVNAF, it is initially forwarded to the province chief, who passes it to corps where it is handed to the DASC.

(3) When the request is approved at corps (ARVN) or FFORCEV or XXIV Corps (US) level it becomes mandatory for the DASC to fulfill the requirement. The DASC may divert an airborne flight in the corps area to meet the call for immediate help or request the TACC to divert strike aircraft from an adjacent corps area or to scramble ground alert aircraft. (Recall that I DASC is allocated scramble aircraft and need only inform the TACC of their launch.) Normally, aircraft are kept on ground alert at all strike bases to respond to immediate requests. They are usually able to arrive over any target in the RVN in less than 40 minutes after the ground commander has requested them. This response time is adequate for the average tactical situation as it usually takes a ground commander about that long to determine friendly positions and the extent of enemy opposition.

(4) To illustrate the immediate strike sequence of events, assume that a US infantry battalion is operating north of Pleiku, when it is suddenly engaged by what is estimated to be major elements of an NVA regiment known to be operating in the area. The battalion is receiving heavy weapons fire and is pinned down. At the brigade TOC, the ALO has the TACP radio operator call the DASC, requesting an

PREPLANNED CAS REQUEST ACTIONS

Company or Cavalry Troop	Battalion or Cavalry Squadron	Bde or Cav Regt ARVN Sector	Division	Corps/FFORCEV	MACV
Commander: 1. Coord req with arty FO. 2. Passes req to bn S3 Air using bn nets.	(TACP) (FSCC) S3 Air: 1. Receives req from units and staff. 2. Plots tgts on map. 3. Coord with- Arty LO FAC (TACP) S3, if need. 4. Assigns Army mission number from SOP. 5. Assigns priority. 6. Passes approved req to Bde S3 Air (Div air req net) FAC: Advises CO on AF capabilities and limitations.	(TACP) (FSCC) S3 Air: 1. Receives req from units and staff. 2. Plots tgts on map. Coord with - Arty LO ALO (TACP) S3, if need. 4. Consolidates req and assigns priorities. 5. Passes approved req to Div G3 Air. (Div air req net) ALO: Advises CO on AF capabilities and limitations.	(TACP) (G3 Air) G3 Air: 1. Performs duties similar to Bde S3 Air. 2. Passes req to G3 Air at Corps/FFORCEV over Army air req net. ALO: Advises CG on AF capabilities and limitations	(DASC) (G3 Air) G3 Air: 1. Performs duties similar to Bde S3 Air. 2. Coord with ALO or DASC, if needed. 3. Checks div priorities as set by CG of Corps/FFORCEV. 4. Coord as nec. 5. Assigns priorities. 6. Passes approved req to TASE as Army requirements. (Army air req net)	(TACC) (TASE) J3 Air: 1. Receives req from Corps/ FFORCEV. 2. Determines req to be approved, based on sorties available and COMUSMACV priorities. 3. Passes approved req to TACC. TACC: Provides number of sorties available to TASE.

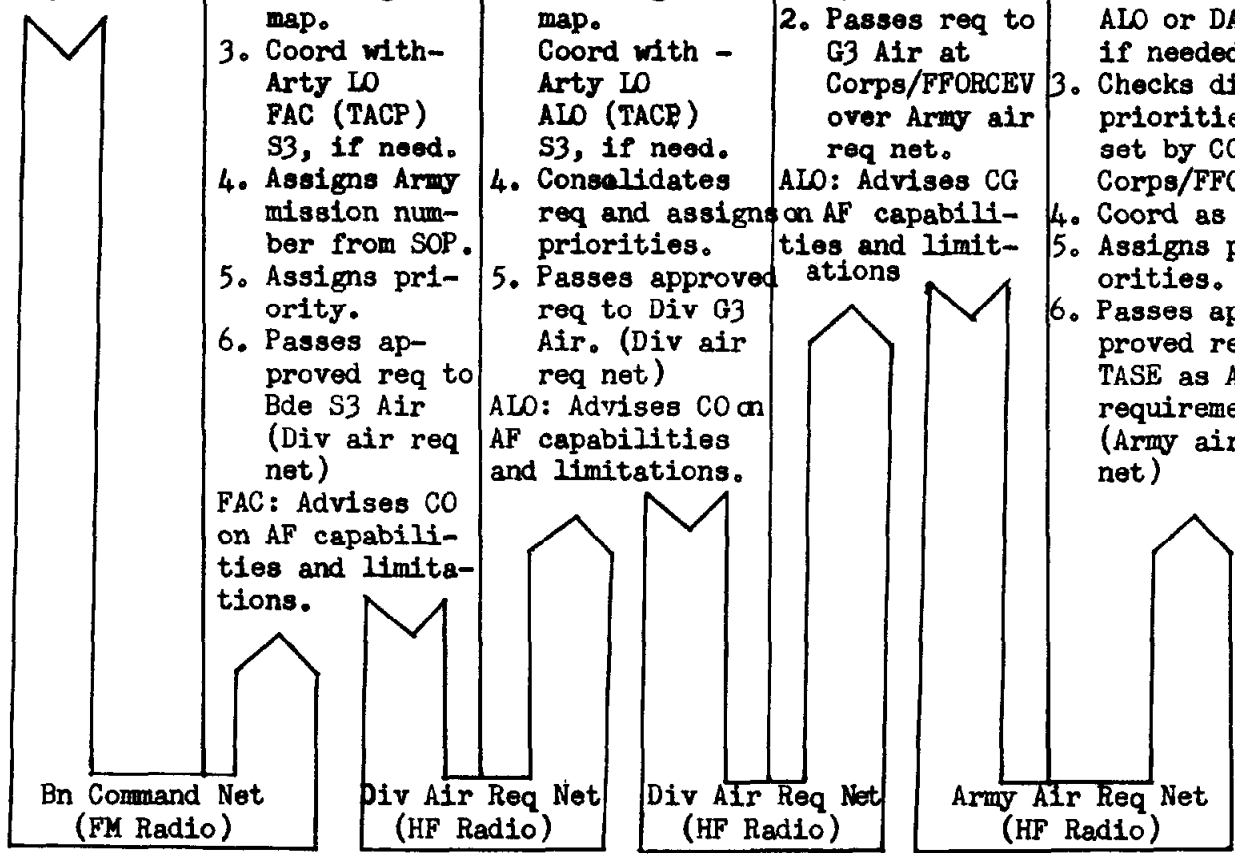


Figure C-15

PREPLANNED CAS EXECUTION ACTIONS

MACV	Corps/FFORCEV	Division	Bde or Cav Regt ARVN Sector	Battalion or Cavalry Squadron	Company or Cavalry Troop
(TACC) 1. Receives Army requirements from TASE in priority order. 2. Determines acft and ordnance reqd to satisfy requirements. 3. Selects units to fly missions. 4. Computes TOTs. 5. Frags fighter units to fly missions. 6. Passes info to TASE - Approp DASC CRC-CRP. J3 Air (MACV) & Corps/FFORCEV: Notifies units of TACC action. (Army air req net)	(DASC) G3 Air: 1. Receives info on missions from TASE/ TACC. 2. Notifies div of actions taken and mission data. (Army air req net) 3. Prepares and disseminates daily changes to air fire plan.	(TACP) G3 Air: 1. Receives mission data from G3 Air Corps/FFORCEV. 2. Coord with TOC elements- Fire Support ALO Army Aviation Air Defense Others, as necessary. 3. Passes mission data to Bde S3 Air. (Div air req net) ALO: Coord with TACP at bde or bn, as needed.	(TACP) (FSCC) S3 Air: 1. Receives mission data from Div G3 Air. 2. Coord with FSCOORD ALO (TACP) 3. Passes mission data to Bn S3 Air. (Div air req net) ALO: Coord with TACP at bn as necessary.	(TACP) (FSCC) S3 Air: 1. Receives mission data from bde and passes to FAC. 2. Coord with FAC on control of strike. If Army acft are to be used, arranges. 3. Passes strike info to units concerned. (Bn net) FAC (TACP): 1. Insures FAC in position to control strike. 2. Coord with Arty LO; arranges for suppressive fires, restrictive fires, and tgt marking. NOTE: Use of restrictive fire plan up to bn CO.	Commander: 1. Informs units of impending CAS strike. 2. Prepares to receive and brief TACP. 3. Marks position. FAC: 1. Coord with arty LO on tgt marking and suppressive fires. 2. Contacts acft at control point. 3. Briefs flight leader. 4. Controls the strike. 5. Gives results of strike to flight leader. (UHF radio) FLIGHT LEADER: 1. Reports result to FAC. 2. Makes in-flt report to CRC. (UHF radio)

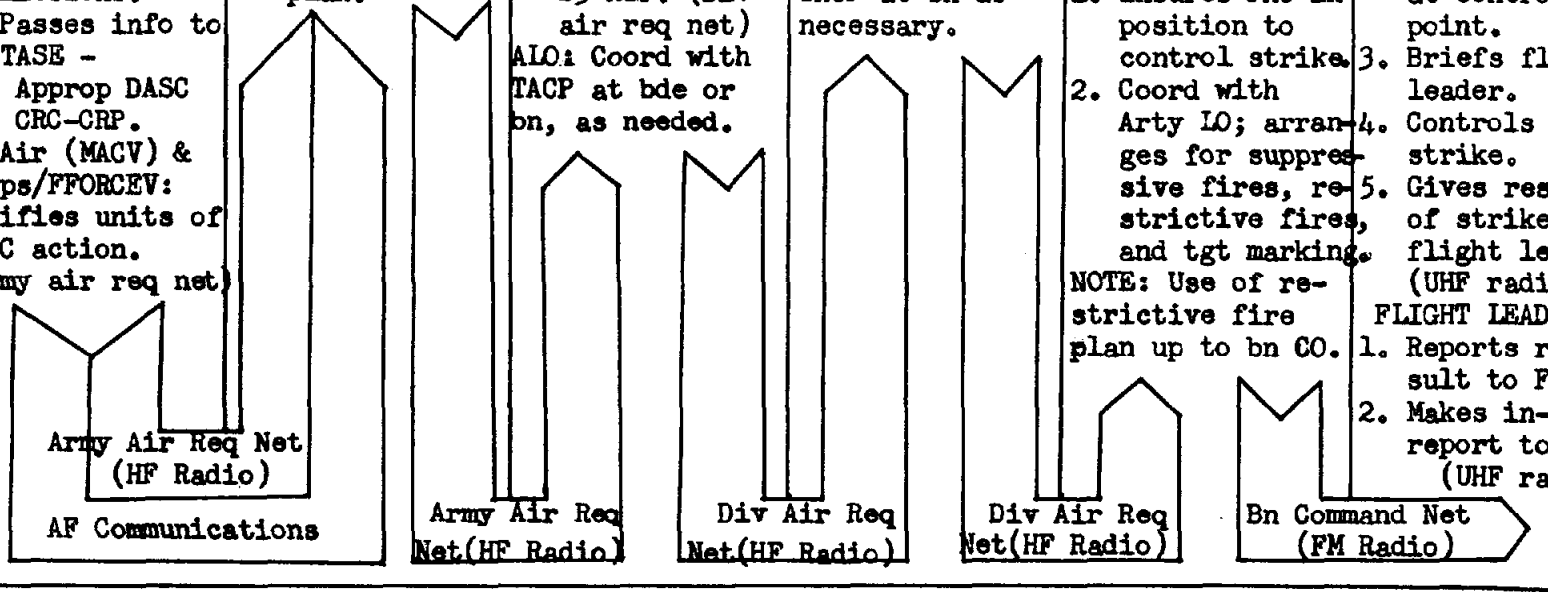


Figure C-16

immediate air strike. The DASC diverts an allocated preplanned strike to satisfy the requirement. In addition, the ALO has called either an airborne or ground alert FAC to advise him of the mission. The control of the strike aircraft to the rendezvous point, the duties of the FAC, and the execution of the strike are generally identical to the sequence of events during a preplanned strike - with two noteworthy exceptions on the part of the FAC.

(a) First, his initial task is establishing the location of friendly and enemy troops. Since many enemy attacks occur at night, and much intermingling and movement of ground forces may take place, the problem of sorting out who is where can be particularly difficult for both the ground commander and the FAC.

(b) Secondly, the FAC must be quick to assess the overall situation as to whether more strikes are needed. If so, the FAC radios either the division or brigade TACP who passes the request to the appropriate DASC. See Figures C-17 and C-18 for more information on immediate strikes.

f. CAS at Night.

(1) Night operations make up a major part of combat actions in the RVN. The enemy launches most of his attacks at night, both against regular troop units and against small provincial outposts - against the small outposts in particular.

(2) There is a weapons system specifically designed to troop counter this night threat. This is the AC-47, known as "Spooky"*, a World War II transport aircraft (the C-47 "Sky Train"), modified by adding three side-firing 7.62 miniguns, each capable of firing 6000 rounds per minute. It also carries 25 flares, each of 2,000,000 candlepower. The AC-119 "Shadow" (Figure C-19) and the AC-119 "Stinger" are other gunships with similar missions. The Stinger is the later Model K AC-119. In addition to the armament of the Shadow, it has two 20mm multi-barrel guns which can fire 2500 HE incendiary rounds per minute; its illuminator is 2,000,000,000 candlepower.

(3) Each night these aircraft orbit bases strategically located throughout the RVN. These aircraft can provide support to the ground commander almost anywhere in the RVN in a matter of minutes. Other gunships are on ground alert.

(4) Each of the provincial outposts is tied to the province (sector) headquarters by radio, either directly or through the district (subsector) post. If an outpost needs air support, it sends a request to the province chief, who contacts the corps TOC. While the request is being coordinated by ARVN G-3 Air at the DASC (DASCs are collocated

*Recently all Spooky gunships have been transferred to the VNAF where they are known as "Hoa Long".

IMMEDIATE CAS REQUEST ACTION

Company or Cavalry Troop	Battalion or Cavalry Squadron	Brigade or Cavalry Regiment	Division	Corps/FFORCEV
Commander: 1. Coord req for CAS with- Arty FO FAC (if present) 2. Passes req to bn S3 Air over bn comd net. NOTE: If bn CO is at company with FAC, can give on-the-spot approval and FAC sends req direct to DASC over AF air req net. If bn CO not present, req must go to bn for approval.	(TACP) (FSCC) S3 Air: 1. Receives req over bn comd net. 2. Plots tgt on map. 3. Coord with - Arty LO FAC (TACP) S3, if necessary. 4. Passes approved req to ALO. ALO: 1. Advises CO on AF capabilities and limitations. 2. Sends req to DASC over AF req net. 3. Keeps S3 Air informed. NOTE: If req disapproved, informs unit and how req will be satisfied. (Bn comd net)	(TACP) (FSCC) ALO: 1. Monitors AF req net. 2. Ack req. After ack, silence is consent. 3. Passes req to S3 Air. 4. Keeps S3 Air informed. S3 Air: 1. Plots tgt on map. 2. Coord with - FSCOORD S3, if necessary 3. Informs ALO of approval or disapproval. NOTE: If req disapproved, ALO informs bn ALO and DASC and how req will be satisfied, as stated by S3 Air. (AF req net)	(TACP) (G3 Air) ALO: 1. Monitors AF req net. 2. Ack req. After ack, silence is consent. 3. Passes req to S3 Air. 4. Keeps G3 Air informed. G3 Air: 1. Plots tgt on map. 2. Checks priority of requesting unit. 3. Checks with fire support element of TOC. 4. Informs ALO of approval or disapproval of req. NOTE: If req disapproved, ALO informs bn ALO and DASC and how req will be satisfied, as stated by G3 Air. (AF req net)	(DASC) (G3 Air) DASC: 1. Acts as control of AF req net. 2. Receives req over AF req net. 3. Passes copy of req to G3 Air. 4. Begins planning CAS mission. G3 Air: 1. Determines priority of requesting division. 2. Plots tgt on map. 3. Coord with these TOC elements - Fire Support Air Defense Army Aviation 4. Approves or dis - approves req. 5. Passes approved req to DASC as Army requirement. 6. If disapproved, inform DASC. DASC informs requesting unit ALO and how req will be satisfied, as stated by G3 Air. (AF req Net)

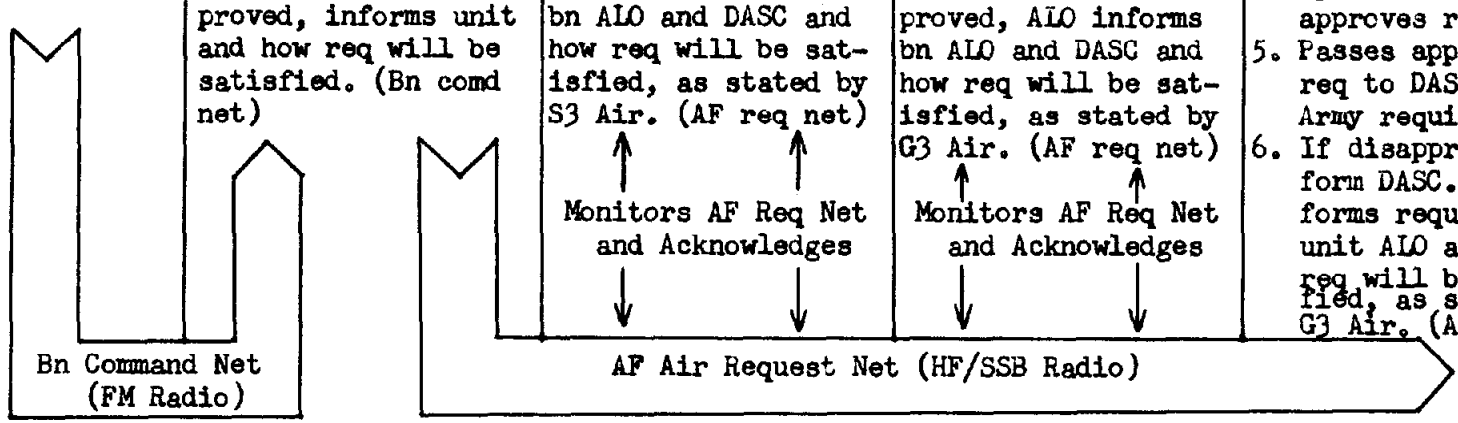


Figure C-17

IMMEDIATE CAS EXECUTION ACTIONS

Corps/FFORCEV	Division	Bde/Cavalry Regt	Bn/Cavalry Sqdn ARVN Sector	Co/Cav Troop
(DASC) (TASE) DASC: 1. Plots tgt on map. 2. Checks sorties available. 3. Checks possibility of divert. 4. Determines acft and ordnance required. 5. Computes TOT. 6. Req scramble from TACC. 7. TACC scrambles and informs DASC and CRC. 8. Fill in air mission data from TACC. 9. Notify CRC and CRP. 10. Give copy of air mission data to G3 Air. 11. Monitor mission. 12. Notify req unit TACP of approval and give air mission data. (AF air req net) 13. Notify G3 Air of strike results. G3 Air: 1. Post CAS status board. 2. Notify req unit of strike results.	(TACP) (TASE) ALO: Monitors DASC transmission. If necessary, relays air mission data to requesting unit TACP. (AF air req net) Monitors AF Air Req Net	(TACP) (FSCC) ALO: Monitors DASC transmission. If necessary, relays air mission data to requesting unit TACP. (AF air req net) Monitors AF Air Req Net	(TACP) (FSCC) ALO: 1. Receives approval and mission data over AF air req net. 2. Coord with FAC. 3. Insures FAC in position to control strike. 4. Passes mission data to S3 Air. 5. Coord with Arty LO; arranges for suppressive fires, restrictive fires, and tgt marking. S3 Air: 1. Receives mission data from ALO. 2. Notifies req unit of approval and other nec info. 3. Coord with TACP on control of strike. If Army acft are to be used, arranges. NOTE: Use of restrictive fire plan up to bn CO.	Commander: 1. Marks position. 2. Coord with bn TACP on tgt location and description. FAC: 1. Coord with arty LO on tgt marking and suppressive fires. 2. Contacts acft at control point. 3. Briefs flight Leader. 4. Controls strike. 5. Gives results of strike to flight leader. (UHF radio) FLIGHT LEADER: 1. Reports strike results to FAC. 2. Makes in-flight report to CRC. (UHF radio)

Air Force Air Request Net (HF/SSB Radio)

Battalion Comd Net (FM Radio)

Figure C-18

Figure C-19

The mission of the AC-119 Shadow gunship is to provide a highly-responsive defense for ground units at night. To do this, it mounts four 7.62mm mini-guns which fire through the square ports on the left side. A 1.5 million candlepower illuminator is also mounted aft on the left side, plus 24 flares. A night observation gunsight is forward on the left side. The AC-47 Spooky is another gunship with a similar mission; it mounts three 7.72mm mini-guns.

with the corps TOCs), the DASC contacts the orbiting gunship through the appropriate CRC/CRP and diverts it to the scene. The DASC passes the coordinates and radio frequency of the ground commanders. While the airborne alert aircraft is enroute to the scene, a ground alert gunship takes off to replace it in orbit.

(5) As soon as the request is approved, the gunship is cleared to fire once FM radio contact is established with the ground commander or outpost. This contact is maintained through a Vietnamese observer aboard the gunship. When it arrives on the scene, it drops flares to light the target. If the ground commander has troops in contact and asks for fire support, the Spooky is authorized to provide it. The miniguns, mounted in the fuselage and pointed almost parallel to the wing, are used to strafe the enemy while Spooky orbits and continues to drop flares. (See Figure C-20.)

(6) In addition to Spooky gunships, strike aircraft are kept on strip alert for action where heavier fire support is required. When these aircraft are scrambled, the Spooky will act as a flareship to light the target for their attack. Frequently, the aircraft and flares over the scene, even without firing, will cause the enemy to break off the attack.

g. Ordnance.

(1) A wide variety of ordnance is available for CAS operations in the RVN. The most frequently used are the general purpose high explosive bombs, commonly referred to as "iron bombs". The BLU anti-personnel and anti-material weapons and the many CBU types are also used frequently. Many aircraft use the highly-effective 2.75 inch rockets, 20mm cannon, 7.62 mm miniguns, and .50 caliber machine guns.

(2) General purpose bombs are used when penetration is desired, as against bunkers or caves. The CBU weapons are used against troops in the open, particularly for linear targets such as enemy along canals. Because of the delivery accuracy of most BLU weapons, they are used against a variety of targets, including those in the immediate vicinity of friendly forces.

(3) The 2.75 inch rocket is used against poorly-defined "soft" targets, such as those found during the escort of herbicide or cargo-drop aircraft when the exact enemy position is not known. The 20mm cannon is a formidable weapon, highly desired by closely-engaged ground commanders because of the accuracy which can be brought to bear on the enemy.

(4) Preplanned strikes are fragged for specific ordnance; loads of all munitions types are available on aircraft standing

strip alert for immediate strikes. Many types of ordnance are effective against a variety of targets; this makes effective ordnance delivery much easier.

(5) See Appendix 2 for additional data on air munitions.

4. DIRECT AIR SUPPORT.

a. Introduction.

(1) DAS is a 7AF interdiction campaign against enemy lines of communication and base areas in the RVN. This program complements other interdiction efforts, striking lines of communication near the borders of Laos and Cambodia. The concept of this program is to strike lines of communications, bridges, truck parks, storage areas, and other related facilities to support friendly ground operations and to hamper enemy resupply of his forces in the RVN. Tactics consist of a concentrated effort on a selected area for as long as required, then a shift to other priority target areas. DAS sorties will not be allocated in a harassment role to strike suspected enemy areas not confirmed by hard intelligence.

(2) To insure flexibility for this interdiction campaign, ARVN Corps commanders have established SSZs and authorized strikes into those areas without further GVN political clearance.

(3) DAS resources managed by 7AF are also allocated on a daily basis to -

(a) Provide escort for supression of ground fire on all herbicide missions and cargo drop operations into areas of known enemy opposition.

(b) Support operational requirements for special missions and exercises directed by 7AF.

b. FAC-Controlled Strikes.

(1) Preplanned DAS missions directed by FACs are planned, fragged, and executed in the same way as are preplanned CAS strikes. Targets are nominated by both ground and AF commanders. As with CAS missions, all strikes must be approved by Vietnamese officials, either on an individual basis or through predelegated authority to a ground commander, and coordinated with the fires and maneuver of the ground commander. Immediate DAS strikes are also made against a variety of targets in a manner similar to immediate CAS missions.

c. Ground-Controlled Radar Bombing.

(1) As a backup for FAC-directed strikes, the USAF MSQ-77 (Skyspot) and USMC TPQ-10 ground-controlled radar systems can be used to carry out DAS missions. (See Figure C-21.) These systems are not intended to replace visual bombing, but rather as a complement to it during poor weather and darkness. They are also used for precise target acquisition during good weather when a FAC is not available or his use is impractical.

(2) The Skyspot radar is a modification of the radar bomb-scoring unit used by the SAC for many years to plot simulated bomb impact points in training SAC combat crews. This radar depends on line of site and therefore is limited by earth curvature and other terrain obstructions.

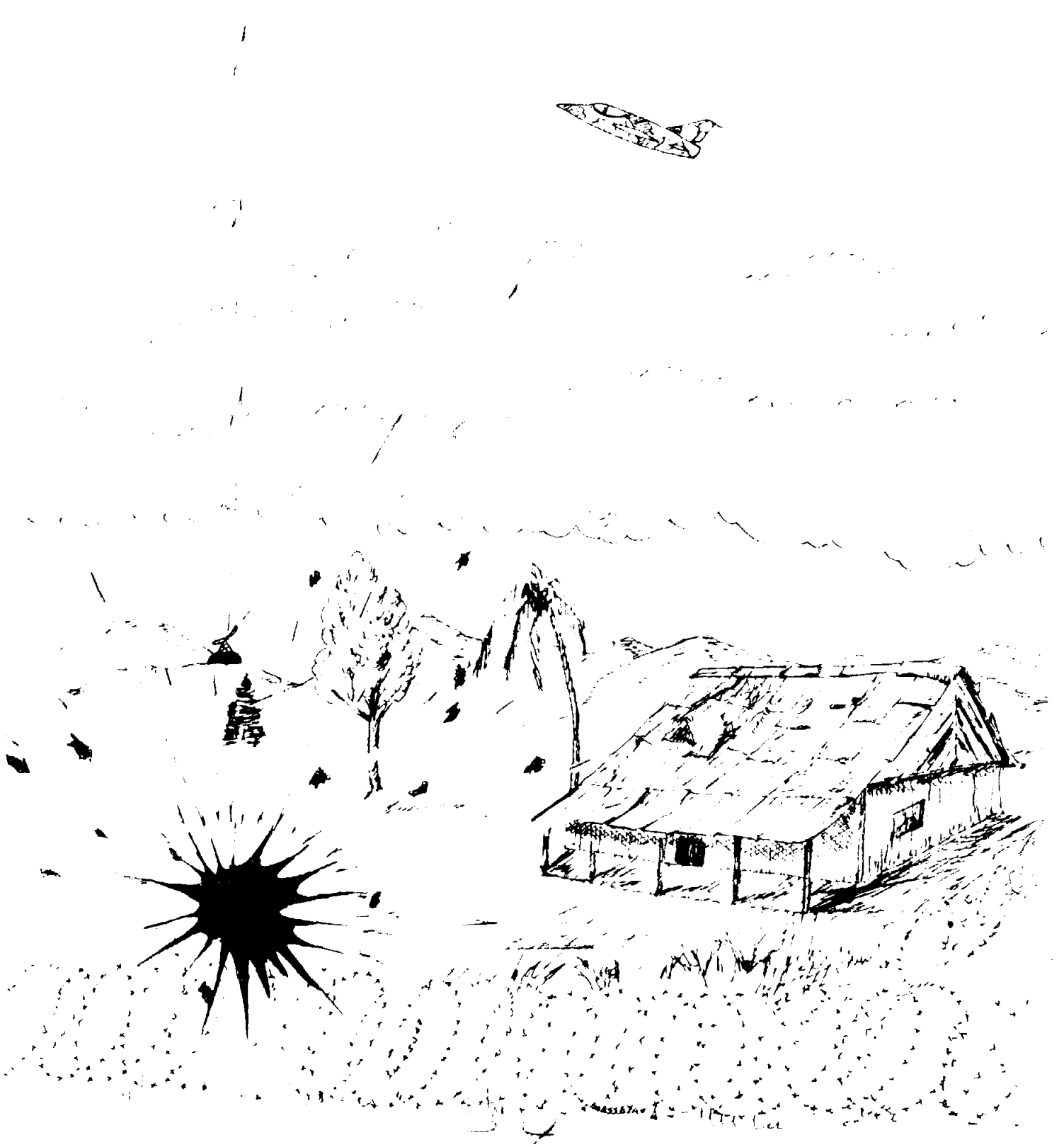
(3) There are enough radar sites in the Skyspot and TPQ-10 systems to provide overlapping coverage of all the RVN. Thousands of sorties have been controlled by these units at night and during poor weather. Although mainly used for preplanned night strikes in a harassment and interdiction role, radar-directed strikes have been used effectively on an immediate basis and in CAS of engaged ground commanders. On several occasions, ordnance has been delivered as close as 250 meters to friendly forces when they were in difficulty and visual strikes could not be made.

(4) Preplanned radar-directed strikes are fragged by the TACC along with other missions. Ordnance always consists of bombs; napalm is not used. After takeoff, the strike aircraft are passed from the appropriate CRC/CRP to a skyspot or TPQ-10 station which directs the strike. The station provides heading, altitude, and airspeed directions to the pilot and, using bomb release tables and wind data, guides the strike aircraft by radar plot to a computed bomb release point.

(5) Aircraft can be diverted to immediate strikes via radar direction after coordination between the DASC and the radar station. The DASC must provide the target coordinates to eight digits (10 meter square), delivery heading and allowable deivation, position of the friendly ground commander, and TOT requirements to the controlling radar station.

GROUND CONTROLLED RADAR STRIKE

Figure C-21



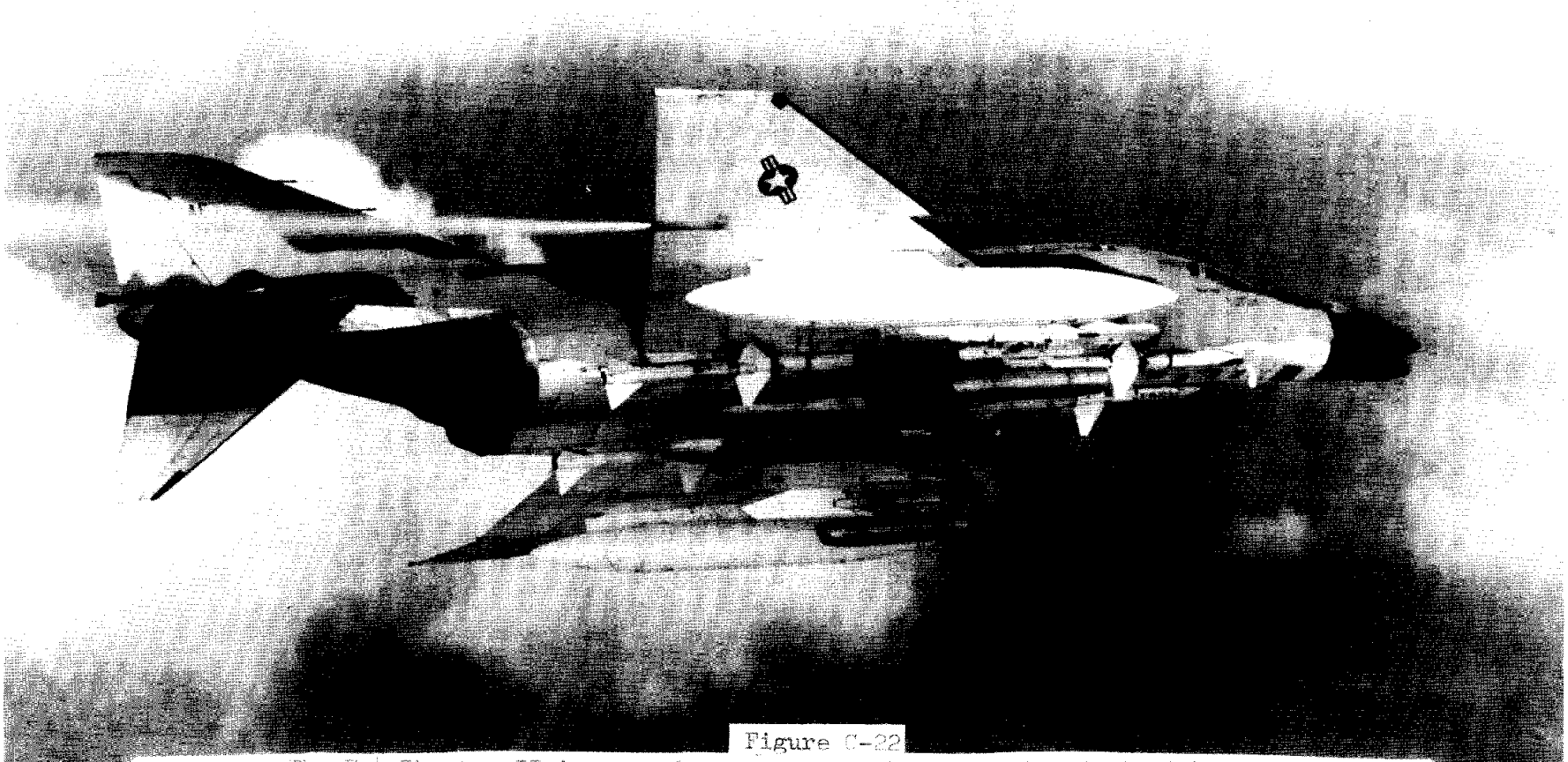


Figure C-22

The F-4 Phantom II is one of the newest and fastest tactical fighters and has become one of the most versatile and widely used jet fighters in the USA. Capable of speeds of 1,600 mph, it can carry twice the bomb load of a World War II B-17 Flying Fortress and has an all-weather bombing system for accurately placing the bombs on target. In addition, it can carry Bullpup, Sidewinder, and Sparrow III missiles; some models have a 20mm cannon. A reconnaissance version, the RF-4, is used in the USAF for aerial recon.

d. B-52 Strikes.

(1) SAC B-52 forces also support ground commanders in the RVN, which is carried out through a systematic program of saturation bombing of area targets. The B-52 aircraft have been modified to carry up to 108 500-pound bombs, internally and externally - a total of 27 tons. Various load combinations of 500, 750, and 1000-pound bombs are used with fusing to fit the target and the terrain.

(2) Command and control of the B-52s used over the RVN are unique. Their control does not fall totally under the 7AF Commander; however, in his role as DEPCOMUSMACV for Air Operations, he does exercise the necessary operational control. The tactics, techniques, and operating practices of the B-52s are determined entirely by the SAC.

(3) Under usual circumstances, COMUSMACV is the approving authority for all B-52 strikes in the RVN. Targets are selected from requests received from the corps (RVN) and FFORCEV or XXIV Corps (US) ground commanders, and others (including intelligence agencies) and arranged on the basis of priority. The desired TOT, ordnance, grid coordinates, number of aircraft, and other standard strike criteria are established and a strike request giving these data is sent to the SAC by 7AF. SAC has operational control of the B-52s and issues the execution orders for the strikes.

(4) The B-52s do not operate under the TACS, in the usual sense of the term. The flights are made on an altitude reservation basis through agreement with the RVN aviation agency. They are radar monitored by CRCs and CRPs throughout the RVN to provide safe separation from TACAIR traffic. Missions are normally fragged 24 hours in advance but the ground commander in contact can have B-52 support within a few hours from a SAC alert force or by diversion of B-52s from another target.

(5) Since June of 1965, the tremendous destructive power of the B-52s has been used to strike enemy base camps, supply points, troop concentrations and other installations and facilities. Psychologically, too, the B-52s have had a damaging effect on the morale of the enemy, as verified by captured enemy and other sources. In some cases, it has taken several days for survivors of B-52 strikes to regroup as an effective force.

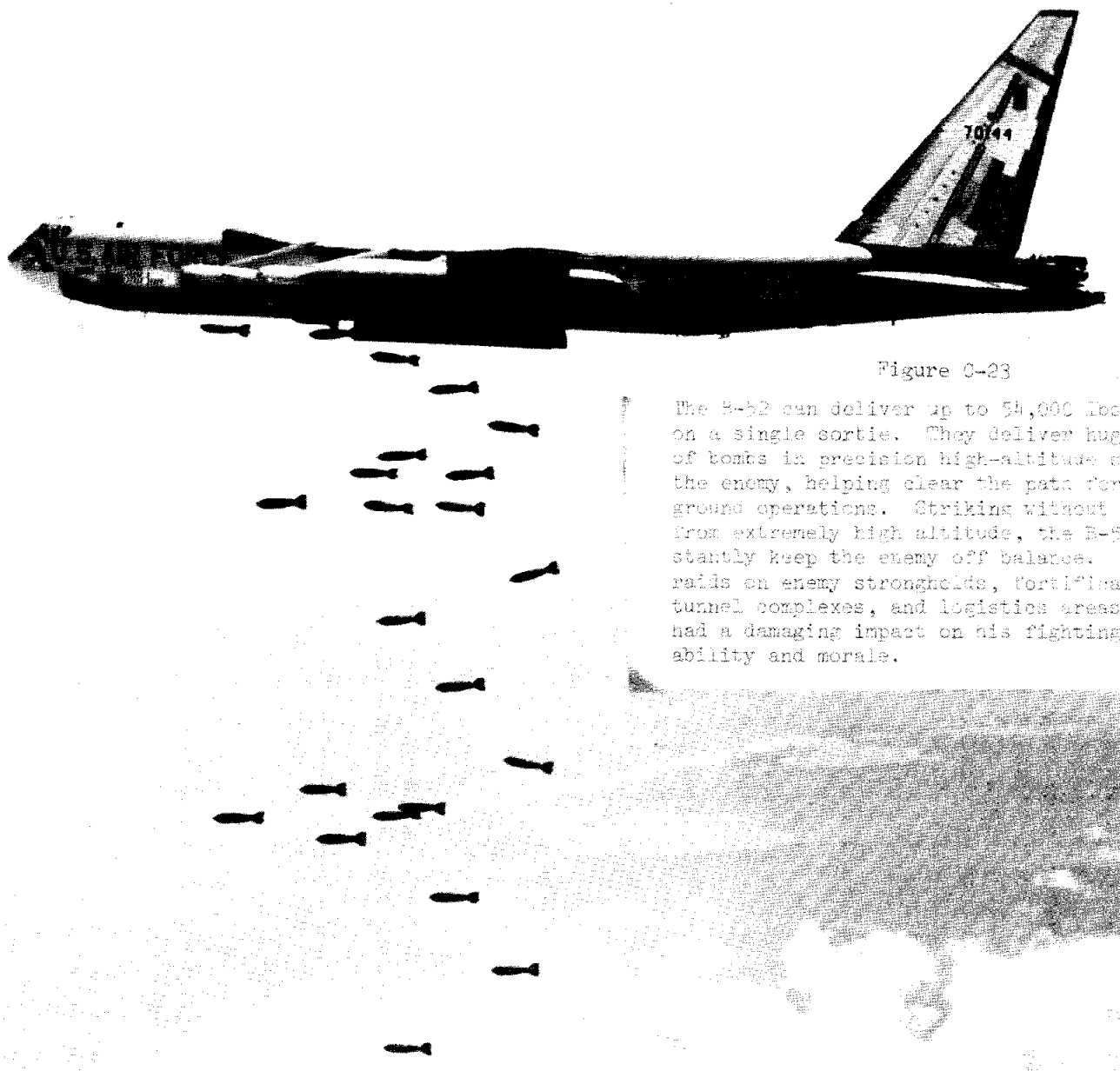


Figure C-23

The B-52 can deliver up to 54,000 lbs of bombs on a single sortie. They deliver huge tonnages of bombs in precision high-altitude strikes on the enemy, helping clear the path for tactical ground operations. Striking without warning from extremely high altitude, the B-52s constantly keep the enemy off balance. Heavy raids on enemy strongholds, fortifications, tunnel complexes, and logistics areas have had a damaging impact on his fighting capability and morale.

5. AERIAL RECON.

a. Introduction. Most of the aerial recon done in the RVN is in support of ground commanders. Recon sorties are also flown for BDA after air strikes. There is also a large number of sorties flown on a daily, continuous basis to search out new enemy activity. USMC aircraft, such as the EA-6A, and USA aircraft, such as the OV-1 and the O-1, are used for a large number of recon support requirements; this support is provided on a direct/general support basis and is directly responsive to the ground commander at regiment/brigade and higher level. However, many requirements, such as photographic and infrared coverage of large areas, are beyond the capability of these systems and are provided by those of the AF. The aerial recon discussed here is limited to that provided by the AF and is included because of its direct contribution to the ground commander's mission and its similarity to TACAIR support.

b. Aerial Recon Sensors. There are five types of recon sensors used in the RVN: photographic, electronic, infrared, SLAR*, and visual. (See Figure C-25) The first four are functions of a specific unit. VR is a function of all aircrews flying over the RVN; the FAC is a major contributor of VR.

(1) Photographic recon gives a graphic source of information for detailed study and analysis. Both black-and-white and color photography, including camouflage detection, are available. Area, point, and strip coverage are the principal types available. Photo recon at night can also be done, using flares to light the area being photographed.

(2) Electronic recon is used to locate and analyze sources of electromagnetic radiation. At present, in the RVN, it is used mainly to locate control and communication systems, both day and night. Should the enemy attain the capability of gun-laying antiaircraft radar, this form of recon would be used to search them out.

(3) Infrared recon is used at night to record on film any areas or objects that emit heat. Such emissions may indicate enemy activity.

(4) SLAR can locate fixed and, to some extent, moving targets along routes of infiltration, such as trails, canals, rivers, and coastlines.

*Not presently a working AF capability.

Figure C-24

The RF-101 Voodoo is a supersonic photo recon aircraft with six pilot-operated cameras in the nose. The cameras can use black-and-white or color film. It demonstrated its effective-ness [illegible] during the 1962 Cuban missile crisis and is now in use in the SVN for aerial [illegible] missions.

RECONNAISSANCE AIRCRAFT

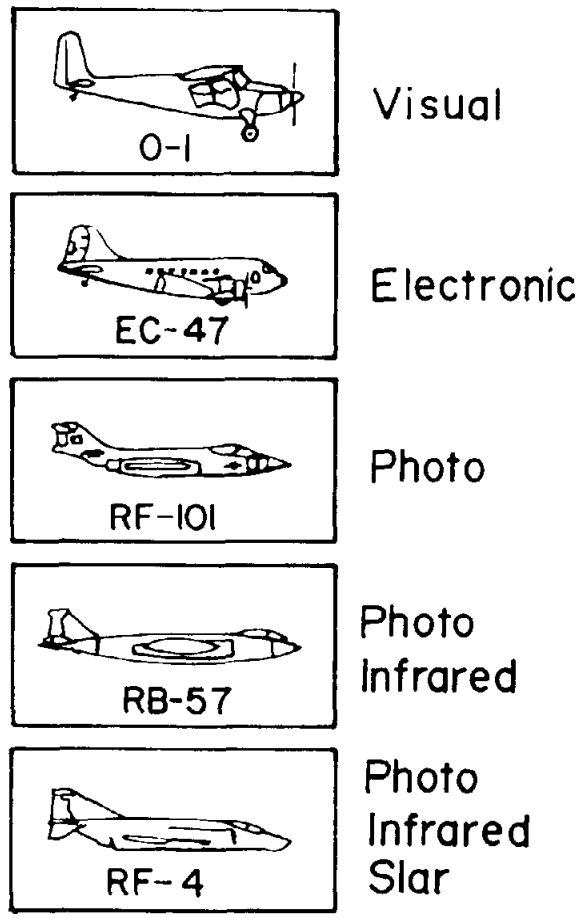


Figure C-25

(5) VR is a rapid way to get to current information. Much VR in the RVN is done by the airborne FACs operating throughout the country. About 70% of FAC sorties are for VR purposes. Each FAC is assigned a specific sector, which he systematically patrols on a daily basis. From these daily flights, a pattern of the habits of the populace becomes apparent and any change in this pattern is good cause for a closer look. When the pattern changes, the FAC reports it to the province chief, who may join the FAC on his next flight. A significant amount of intelligence is gathered in this manner. Upon landing, the FAC is debriefed and the information passed to the DASC. The information from the various TACPs is consolidated at the DASC and submitted to the TACC. Items include enemy activity, structures, base areas, logistics, infiltration routes, and BDA. The resulting DISUM is used to develop targets, verify other intelligence, determine the effectiveness of weapons used against the enemy, and to degrade targets which have been struck. Also, the information is used to compile data on the results of specific air strikes, including enemy casualties inflicted by aircraft weapons. The VR reporting net is shown in Figure C-26.

c. Recon Requests.

(1) Specific requests for aerial recon usually begin with the ground commander. AF recon officers assigned to the DASCs, along with unit ALOs, assist ground commanders in requesting aerial recon. These officers also advise and assist the S-2 staff on matters pertaining to aerial recon, review recon requests, and arranged for artillery coordination for all recon missions flown in their area of responsibility.

(2) Recon requests are processed in roughly the same manner as are requests for TACAIR support, i.e., through corps (ARVN) and the FFORCEVs and XXIV Corps (US). In addition to those from ground commanders, other requests are originated by various intelligence agencies, e.g., 7AF DCS/Intelligence, CICV, and MACV Studies and Observations Group. Recon requests are sent to the MACV TASE where a MACV J-2 Air Officer evaluates the request. If approved, it becomes a requirement and is passed to the 7AF In-Country Recon Staff. Each request includes the type product desired, scale, date no longer of value, and priority. The In-Country Recon Operations Branch prepares the frag order that tasks the recon unit, the 460th TRW, which groups assigned targets according to priorities, the forecasted weather, and system capabilities.

(3) Recon missions are monitored by elements of the TACS after coordination with FSCCs to provide artillery clearance. Usually, each mission is assigned several target areas. Recon operations continue around the clock, using infrared and radar at night to complement photography.

VISUAL RECONNAISSANCE REPORTING NET

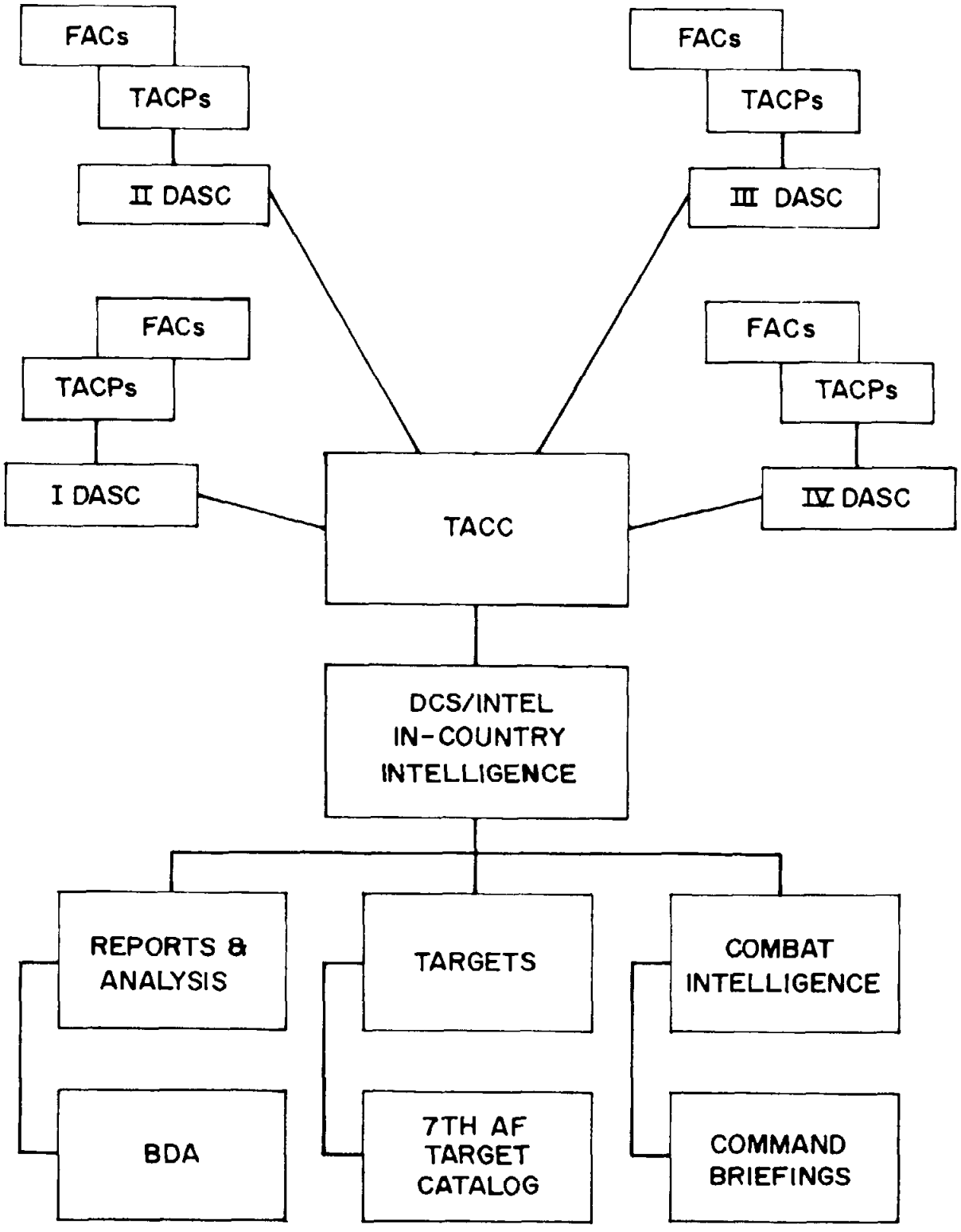


Figure C-26

d. Recon Exploitation.

(1) Once the recon aircraft has returned, the exploitation of the data begins, to include getting it to the requesting ground commander. In the case of photography, the film is processed immediately by the PPIF attached to the tactical recon squadron. The PPIF prepares a "trace" which specifically marks the location of the photos, makes an IPIR, and produces the required prints and duplicate imagery. The IPIR is provided to the original requestor as a spot report, by teletype or telephone. Army Recon Liaison Officers located at the 460th TRW assist in getting this data to field units. The imagery and "trace" are flown to the requestor. Army MIBARS detachments, located in each CTZ, look at this data in more depth and prepare a SUPIR.

(2) The ground commander uses spot reports, photos, the IPIR, and the SUPIR in determining whether to strike a target, where, and with what type munitions. He may decide to use artillery rather than to request TACAIR. If, for example, the recon products requested by CICV or 7AF DCS/Intelligence indicate a profitable target, the decision to strike must still come from the ground commander. Should a worthwhile target be found as a result of a 7AF DCS/Intelligence request, the information is passed to the appropriate DASC, then to the appropriate ALO who recommends that the ground commander request a strike.

(3) The intelligence agencies, such as CICV and 7AF DCS/Intelligence may develop a B-52 target after studying photos, infrared recon, information from agents, road watch reports, and VR. These agencies may also develop strike requests for special operations. These are generally the only strike requests generated by intelligence agencies and fowarded directly to the TASE.

e. Other Recon Forces. USMC air units in I CTZ and VNAF also provide valuable recon to complete the intelligence picture compiled by the 7AF and Army aircraft. The J-2 element of the TASE supports not only the US Army and the ARVN, but also FWMAF.

6. SUMMARY OF TACAIR SUPPORT.

a. TACAIR operations are being conducted in the RVN within the framework of a system which evolved from lessons learned in World War II and Korea; this is the TACS. There is a greater amount of centralized control of TACAIR in the RVN than was originally intended for the TACS. This is due to a formidable air capability being concentrated in a small geographical area - reaction from an air base to a target is counted in minutes - and an extensive communications net makes possible the command and control of this capability from a single point.

b. TACAIR in the RVN has been tailored to operate within the relatively permissive environment that exists because of friendly domination of the air. This is the key to departure from doctrine or classical methods of operation. Certain tactics and techniques developed and in daily use in the RVN would not be feasible in another theater where the enemy has his own air capability and more effective air defense weapons. We have been permitted to develop and use nonstandard tactics and weapons systems. The unrestricted use of the airborne FAC is one example - the ability to put him above terrain obstacles and ground foliage, where he can pinpoint both friend and foe, has been invaluable to the friendly ground commander. The Spooky gunship is another example.

c. The B-52 operations have seriously hampered the enemy's ability to concentrate men and supplies. These raids, and the use of radar-controlled strikes, have greatly aided interdiction in the RVN - again with the objective of supporting the ground commander.

d. Likewise, most of the aerial recon effort in the RVN is in direct support of the ground commander. The nature of the war makes it extremely difficult to follow the movement and intentions of the enemy. This problem has been greatly simplified by using the airborne FACs to police their sectors on daily flights; any change in the normal pattern of the countryside, such as lack of people in the fields, fresh excavations, or evidence of unusual travel along the trails may indicate enemy activity. A ground commander can obtain specific recon of a target or area by requesting it in much the same way as he would request an air strike.

Appendixes:

1. CAS Info for Ground Commanders
   4th US Infantry Division

2. General Air Munitions Data

APPENDIX 1

*CLOSE AIR SUPPORT INFORMATION

FOR

GROUND COMMANDERS

PREPARED BY
UNITED STATES AIR FORCE
DIVISION AIR LIAISON OFFICE
4TH INFANTRY DIVISION

1 JUNE 1969

*Edited for consistency with other parts of this Lessons Learned. The substance is unchanged.

1. INTRODUCTION.

This information pamphlet has been prepared to assist you in the safe, effective employment of tactical air support. The subject items listed are not intended to be all inclusive. It is obvious that each unit may have unique situations which may call for more stringent precautions or undesired indentification. In any case, it is your responsibility to be thoroughly cognizant of the precautions and procedures necessary for the safe and successful employment of tactical air support. Your Forward Air Controller will assist you during each strike, and he is just as anxious as you to get "Charlie" off your back.

2. PRE STRIKE PROCEDURES.

a. Marking Devices and Procedures.

(1) Each maneuver element must have adequate smoke grenades to mark their position repeatedly should conditions warrant. Each man in each maneuver element should carry smoke. Commanders should carry even more. HAVE ENOUGH.

(2) Mirrors are very effective during sunny weather conditions.

(3) Penlite flares are very useful especially in dense jungle where your smoke may hang at tree top level.

(4) Marking panels are useful for permissive terrain and where disclosure of precise location may be hazardous. If you use panels, do not transmit their color, geometric pattern or shape-wait until the FAC verifies it for you.

(5) Strobe lights-effective for night strikes. Use flares for initial location, then strobes for precise location.

(6) Balloon marking device-gives continuous location of friendlies. Currently undergoing field testing. See S-4 for issue and tests with your unit.

b. Communication.

(1) Battalion/Company/Platoon Commanders must remain on the radio to:

(a) Confirm location of his marking device relative to his location.

(b) Confirm proper placement of FAC's mark.

(c) Adjust subsequent air delivered ordnance.

(2) Except in extreme emergencies, Ground Commanders should be in direct radio contact with the airborne FAC. A radio operator should not relay instructions and corrections unless absolutely necessary.

c. Location of Elements. The exact position of all your elements must be known.

d. Troop Protection. You must know if your troops have any protection and cover. It is an essential requirement that the FAC be advised of the protective cover available to the ground forces. Tell him if you are dug in or behind trees, or in the clear, or what. Be specific. Then when the strike begins all troops must keep their heads down -- don't sight-see an airstrike!

e. Air Request. Know the proper terminology for requesting strikes- don't request air for a single sniper; but, if you have significant contact, get a request for a FAC to have a look. Then, jointly determine your need.

f. Artillery. Be prepared to check fire supporting mortar and artillery fire on the request of the FAC. He can best help you if he can have a couple of minutes to locate the target before the fighters arrive. He can't pinpoint a position, yours or the enemy's, if he is busy dodging friendly artillery rounds.

3. STRIKE PROCEDURES.

a. Friendly Location. Be as precise as possible; know your location, use land marks and prominent geographical features to convey your location in relationship to target area. By all means, you must know which way your elements are in relation to your position. If you aren't certain, you're asking for trouble. Find out and explain your line of elements to the FAC utilizing compass directions as well as terrain features. BE PREPARED!

b. Enemy Location. Try to be as specific as possible to insure the first strike is right on target. Give the FAC a reference to guage your estimate of distance, i.e.; "The distance from my smoke to the large clearing to my south, I estimate to be 100 meters. The target is 300 meters to the east of my smoke." Now the FAC has a better idea of how to correlate your directions and corrections to what he sees on the ground.

c. Marking Procedures.

(1) Wait till the FAC tells you to mark, then do so immediately.

(2) Do not divulge the color of your mark; the FAC will tell you what he sees. You confirm his sighting after he calls the color.

(3) Mark your boundaries, i.e., lead and flank elements. Elements should mark their position nearest target area. When it looks close to the FAC, he will insist on at least three smokes-both flanks and center. Give them to him!

(4) Give FAC a verbal description of the perimeter orientation. Use compass azimuth, i.e., "I'm facing 220° and my elements are oriented northwest to southeast."

(5) Be prepared to re-mark for the fighters during the course of the air strike. Many times the smoke is blown away, and the terrain features may not be easily retained by the FAC and fighters.

d. Adjustment of the FAC's Mark. Be prepared to observe the FAC mark the target. He will tell you: "I'm going to mark, you adjust from my smoke." The easiest target for a fighter pilot to hit is the FACs marking rocket. If at all feasible, try to adjust him right on the enemy location you want destroyed. He usually has an ample supply of rockets, so let him mark again if the first one or two are way off.

e. Adjustment of Air Delivered Ordnance.

(1) Ordinarily, the FAC will have one of the two fighters drop ordnance, then ask you how it looks. If you can, on the FAC's request only, raise your head and see where the first bomb or napalm hit. The FAC will hold the fighters high and dry until you verify the ordnance on target. Your guidance may place the next bomb precisely where the tactical situation dictates. You, as the ground commander, are most knowledgeable of the changing course of the battle. By moving the ordnance in response to specific and clear instructions, the FAC can better provide the air support you need. Remember: If the ordnance is being dropped close-in, keep your heads down until the FAC tells you to look and adjust.

(2) Be familiar with the lethal radius of the forthcoming ordnance. Your assigned FAC or ALO has this information. Should you desire impact of the ordnance such as to place your own perimeter within the lethal radius of the specific ordnance, the FAC

may suggest another location or refuse to commit the fighters on that location. In an extreme emergency, if you insist on moving the strike closer than the FAC deems safe, he will ask you to assume the responsibility. This is a tough decision, but it has been made before.

f. Precautions.

(1) Be positive of your smoke and the relationship of the FAC's mark both to your location and to the target.

(2) Report any overflight of the fighters to the FAC immediately. If you can anticipate that your position will be overflown- immediately advise the FAC to send the fighter through dry. We can always make another pass. Normally, the fighters never fly directly over the friendlies while in an ordnance delivery pattern.

(3) Be sure of your ground orientation. The target may be 200 meters East, and if you authorize an east to west pass, you may be in for trouble. Check the compass and be sure of the target azimuth and the proposed run in. Check the fighters to insure your location is not in jeopardy.

(4) Insure you know the exact location of all your positions and troops. An element only 100 meters further away than you think may place them inside the lethal radius of ordnance and cause friendly casualties.

(5) Know the ordnance limitations. The FAC will brief this item, but every close air strike mission is different. A lot depends on your cover, weather, proximity of the enemy, their cover, type of ordnance being delivered, etc.

(6) Advise the FAC of all movement of your troops. Hot pursuit of the enemy has taken friendlies into the strike area without the knowledge of the FAC. This is a short round in the making! The wisest decision is to keep all your troops down and in place until the strike or strikes are completed.

(7) If you hear or see the enemy firing at the FAC or the fighter, advise the FAC at once. He must advise the fighters of ground fire so they can maneuver to avoid it.

4. POST STRIKE PROCEDURES.

a. Plan ahead for additional air support. This keeps constant pressure

on the enemy. If the first strike is missing the target area, or you receive fire from a different location, advise the FAC and get more air on the way....BE PREPARED!

b. Plan to reinstate your artillery support as soon as the FAC clears the target area. Close coordination on the gun target line and a mutually agreed FAC holding area enables you to apply continuing pressure. If subsequent strikes are forthcoming, advise artillery you will be calling for a check fire when the next set of fighters are on station and ready to go to work for you.

c. Relay an estimate of residual enemy resistance and the locations to the FAC. This will assist him in locating the enemy before the next strike arrives. If you are able to put a WP mortar round in the target area after the fighters and FAC have cleared the target area-the more effective TAC AIR will be.

d. The FAC relies heavily on you for his BDA (Bomb Damage Assessment). If you see results of the strike, either from your location or from a subsequent sweep of the area, tell the FAC. If he isn't on station at the time, relay the info to the Brigade S-3 Air. The fighter pilots would like to know when they've done some good work as much as you are pleased with your work. "Killed by Air" and other results of air strikes are the things which make <u>good</u> fighter pilots <u>better</u> fighter pilots!

5. <u>SUMMARY</u>.

The application of tactical airpower in a close-air support environment is, at best, a difficult task. The FAC with whom you work has been highly trained, as have the fighter pilots. Their prime mission is to place the ordnance on the enemy to relieve the pressure exerted on you. To do this, the FAC must rely on your knowledge of the ground situation before he can safely and effectively direct the air support. The responsibility for this mission cannot be carried solely by anyone. It is a team effort of you, the FAC and the fighter pilot. Here's hoping you are never in dire need of TAC AIR, but if you are, BE PREPARED!!

APPENDIX 2

GENERAL AIR MUNITIONS DATA (U)

1. (C) GENERAL PURPOSE BOMBS.

a. Design. General purpose (GP) bombs are designed to provide both blast and fragmentation effects. The most extensively used GP bombs are the 500, 750, and 1,000 pound munitions. For special missions, 2,000 lb GP and 3,000 lb demolition bombs may be available also. GP bombs of 500 and 750 pounds can be delivered in a low or high drag configuration.

b. Effectiveness. Examples of effectiveness for various fuze options are shown on the next page as crater widths and depths for several fuze/bomb combinations (earth detonated). In general, if blast and fragmentation effects are desired (personnel and materiel targets), proximity fuzes, fuze extenders, or instantaneous fuzing should be requested. If cratering or destruction is desired (roads, low bridges, or bunkers), appropriate short fuze delays should be requested. These crater dimensions apply only to the low drag configuration discussed in the subparagraph below; cratering efficiency will be significantly reduced for high drag bombs, because of less penetration.

c. Low Drag Bombs.

(1) General. Low drag bombs (slicks) are cylindrical and are equipped with conical fins for external carriage on fighter aircraft. They have nose and tail fuzing to increase functioning reliability and to obtain the desired terminal effects (ie. blast, fragmentation or cratering.)

(2) Delivery. Low drag bombs will normally be delivered from a 20°- 60°dive angle. Level deliveries between 500' and 2000' AGL are possible for 750# and smaller bombs but optical sighting system limitations degrade the accuracy of such deliveries. Twenty degree dive deliveries require a ceiling of about 4000' and a visibility of about three miles. However, deliveries can be made with a ceiling of 2000 feet. The following table provides estimates of combat delivery accuracies for low drag bombs.

BOMB TYPE	A/C	DIVE ANGLE	AGL-FT	KTAS	REP-FT	DEP-FT	CEP-FT
MK82, M117	All Jet	45°	4500	500	200	140	300
MK84, M118	All Jet						
MK82, M117	A-1	30°	2500	450	160	90	220
MK82, M117	A-1	30°	2000	325	110	70	160

CONFIDENTIAL

FOR DEEPEST CRATERING EFFECTS

500 KTAS
45° Dive

ORDNANCE	OPTIMUM FUZE DELAY	STRIKING VELOCITY	ANGLE OF PENETRATION	CRATER DIAMETER SOIL SOFT	CRATER DIAMETER SOIL MED	CRATER DIAMETER SOIL HARD	CRATER DEPTH SOIL SOFT	CRATER DEPTH SOIL MED	CRATER DEPTH SOIL HARD
MK 81 (250 lb GP)	.01	1000fps	58°	32'	19'	10'	14'	6'	2'
MK 82 (500 lb GP)	.01	1000fps	58°	40'	23'	14'	17'	7'	2'
M117 (750 lb GP)	.01	1000fps	58°	48'	26'	16'	21'	9'	3'
	.025	1000fps	58°	---	35'	18'	---	7'	3'
MK 84 (2000 lb GP)	.025	1000fps	58°	72'	49'	26'	32'	13'	4'

CONFIDENTIAL

UNCLASSIFIED

UNCLASSIFIED

Methods of measuring delivery accuracy are Range Error Probable (REP), Deflection Error Probable (DEP) and Circular Error Probable (CEP). REP is half the range distance between two points, equidistant from the target, that contains 50% of the impact points. DEP is half the lateral distance between two points, equidistant from the target, that contains 50% of the impact points. CEP is equal to the radius of a circle around the target which contains half the impact points.

(3) Fuzing. The terminal effects obtained from a high explosive bomb are determined by its fuzing. Low drag bombs can be fuzed for instantaneous or delayed detonations after impact. Low drag bombs are usually configured with both a noze and tail fuze and the pilot has the capability of selecting either one or both fuzes. Therefore, if a bomb has one fuze with an instantaneous element and the other with a delay element, the pilot can select either instantaneous or delay fuzing as desired.

Fuzes compatible with the bombs and other munitions listed here include impact, proximity, and airburst time fuzes. Where a munition is limited to use with only one of these specific fuze classifications, it will be so noted in the weapon data. Reliability, safety features, weapon effects, and delivery considerations vary with the type of fuze used; consequently, selection of the proper fuzing is as vital as selection of the bombs themselves.

(a) Impact Fuzes. These fuzes initiate the fuze-bomb explosive train upon impact. Actual detonation of the bomb may be instantaneous or may be delayed through the use of pyrotechnic delay elements in the fuze. On M904 and M905 fuzes, instantaneous functioning or short delay elements (0.01, 0.025, 0.05, 0.1, and 0.25 seconds) may be preselected on the ground. M906 tail fuzes provide a medium delay of 12 seconds. The FMU-72 long delay fuze provides selectable delays up to 36 hours.

(b) Proximity Fuzes. These fuzes are designed to burst a munition at a preset distance above the target. Proximity fuzes contain a radar transmitting and receiving unit which operates on the doppler principle. Low altitude (0 to 50') and high altitude (50' to 3000') proximity fuzes are in the inventory. (Note: The available World War II proximity fuzes are low speed delivery and have very poor reliability.)

(c) Airburst Time Fuzes. These fuzes contain a mechanical or electric timer which is initiated upon release and airbursts the bomb after the preset time interval.

This type fuze is generally used on dispenser munitions, bomb clusters, photoflash, leaflet bombs, etc.

(d) M1A1 36" Fuze Extender. This fuze extender, commonly called the "Daisy Cutter" consists of an explosive filled length of steel tubing. The extender is installed in the nose fuze well adapter booster and an instantaneous fuze is installed in the forward end of the extender. An inertial non-delay fuze may be installed in the tail fuze well. This arrangement detonates the bomb above ground, and improves both blast and fragmentation effects. It is very effective when used against enemy troop concentrations even in forested areas. When fuze extenders are used, minimum safe distance from friendly troops is increased. Until more accurate data are provided, double the published minimum safe distances when employing fuze extenders.

d. High Drag Bombs.

(1) General. High drag bombs are MK 82 (500#) and M117 (750#) bombs with the conical tail fin removed and folding retarding fins installed. These fins open after the bomb is released to provide the aircraft safe separation from the blast and fragmentation effects of the bomb. This provides the fighter aircraft with the capability to deliver ordnance under low weather conditions. Also, because of reduced slant ranges at release, the high drag bomb can usually be more accurately delivered than the low drag bomb.

(2) Delivery. High drag bombs will normally be delivered from 10° - 20° dive angles with releases 500-1,000 feet AGL. This will require a ceiling of 2,000-4,000 feet and a visibility of 2-3 miles. Aircraft are vulnerable to small arms and light AAA fire during the delivery of high drag bombs. Therefore, low drag bombs should be used wherever possible and high drag bombs used only when weather or other situations dictate. The following table provides an estimate of the combat delivery accuracy for high drap bombs.

BOMB TYPE	AIRCRAFT	DIVE	KTAS	RELEASE ALT (FEET)	REP-FT	DEP-FT	CEP-FT
Snakeye and M117 Retarded	All	20°	450	800'	100	50	130

(3) Fuzing. The high drag bombs are double fuzed, nose and tail. The nose fuze for a high drag bomb is the same as that of a low drag bomb and can provide the same delays. The tail fuze provides only an instantaneous detonation.

If a delay is desired, the tail fuze will not be used.

2. (C) NAPALM. Napalm or "fire bombs" are cylindrical, thin skinned aluminum tanks filled with various types of incedigel mixes. It is one of the most versatile tactical fighter weapons since pilots have considerable leeway in delivery accuracy and need only insure that ordnance impacts are short of the target by about one-half the effective pattern length. Even with a near miss, napalm can be highly destructive to personnel, and to equipment that is vulnerable to its effects. Fuzing consists of an impact fuze which ejects white phosphorus (WP) into the splash pattern. Napalm cannisters have fuze igniters installed in both nose and tail. Napalm is available as 500# and 750# munitions and can be delivered in the unfinned or finned configuration. The napalm flame pattern may be as large as 40 X 180 meters when delivered from low altitude at high speed. Best delivery is parallel to friendly troop positions.

a. Unfinned Napalm.

(1) General. Unfinned napalm bombs are unstable after release with random tumbling until impact. Impact ruptures the napalm can and spreads the napalm mix over an area forward of the impact point.

(2) Delivery. Unfinned napalm is usually dilivered from low (0° - 20°) dive angles, low (50' - 800' AGL) altitudes and high (up to 500 knots, depending on aircraft) speed. Delivery can be conducted under ceilings as low as 800' - 1000' AGL with visibilities of 2 to 4 miles (The lower visibility is for slower aircraft). A-1 aircraft may deliver unfinned napalm in dives up to 45°.

b. Finned Napalm.

(1) General. Finned napalm has predictable ballistics which allow accurate delivery from high dive angles and altitudes. As dive angle or release altitude increases, however, the pattern size decreases and effectiveness is reduced.

(2) Delivery. Finned napalm is better suited for penetration of jungle canopies than unfinned napalm when delivered from dive angles of 20° or greater.

c. Delivery Accuracy. The following table provides an estimate of combat delivery accuracy for napalm:

AIRCRAFT	ANGLE	KTAS	AGL (FT)	REP-FT	DEP-FT
All	0°	450	100	100	20

d. Napalm Mixtures:

(1) Napalm. Napalm is a mixture of gasoline and M-4 thickener which tends to adhere to a target. Napalm burns for approximately 15 to 30 seconds at temperatures up to 1400° F and is effective against combustible or partially combustible targets and those targets which can be damaged by intense heat. This category of targets includes: parked aircraft, vehicles, ammunition and supply depots in the open, POL dumps, stationary armored vehicles and tanks, unhardened radar and communication facilities, exposed personnel, and warehouses of combustible construction.

(2) Napalm B. Napalm B, the newest incendigel mix, provides increased burning times and improved terminal effects. It is a mixture of polystyrene, benzene, and low octane gasoline, mixed in a ratio of 50%, 25%, and 25% by weight. Napalm B is more viscous than other incedigel mixes which improves its adherence to target surfaces and reduces the "fire ball" effect. It burns for up to 10 minutes.

3. (C) ROCKETS

a. General. The 2.75" folding fin aerial rocket (FFAR) was originally designed for air-to-air use, but is now used as an air-to-ground antipersonnel and materiel munition. Several different warheads can be installed. The rockets can be carried in two different launchers. The LAU-59 is a reusable launcher that carries 7 rockets. The LAU-3 carries 19 rockets and is jettisoned after firing.

b. Warheads.

(1) MK 1 (HE). The high explosive head produces blast and fragmentation. Detonation of the MK 1 head ejects 750 fragments with an average velocity of 3780 feet per second. These fragments are capable of penetrating 1/8" of mild steel at a distance of 30 feet from the point of detonation. When firing against targets on soft ground, most of the rocket fragmentation will probably be absorbed since warhead fuzing will allow the head to penetrate the ground prior to detonation. Lethal radius for a single rocket against men standing is 20' and for men prone is 12'.

(2) MK 5 (HEAT). The high-explosive antitank warhead, with its specially designed shaped charge, is capable of penetrating up to six inches of armor with an impact normal (90°) to the surface. The weapon will have a negligible effect unless a direct hit is obtained.

(3) M151 (HEAP). This high-explosive antipersonnel warhead has a "super-quick" fuze which causes detonation prior to penetration of the head into soil or sand. Lethal radius for a single rocket against men standing is 39 feet and for men prone is 26 feet.

(4) WDU-4A/A (Flechette). This antipersonnel warhead contains 2400 twenty grain flechettes which are expelled from the warhead at motor burn out. The flechettes resemble small darts and inflict casualties by virtue of their high energy level at impact. Foliage degrades the effectiveness of flechettes and they should not be used under jungle canopy. Flechettes have very limited capabilities against materiel or shielded personnel. The following table shows pattern sizes for various delivery parameters:

DIVE ANGLE	ALTITUDE AGL (FEET)	PATTERN WIDTH AND LENGTH (FEET)
10°	800	300x1200
20°	1400	300x1200
30°	2200	250x250
30°	3000	400x500
45°	3600	250x300
45°	5000	400x500

(5) M156WP. The warhead contains 2.0 lbs of white phosphorous (WP) and 2.0 ounces of B-4 high explosive. Upon detonation, the high explosive ruptures the warhead and dispenses the WP to generate a white cloud of smoke.

c. Delivery Accuracy. All fighter aircraft deliver rockets from a dive, with angles varying from 10° to 45°. The following table provides an estimate of combat delivery accuracies for rockets:

TYPE	DIVE ANGLE	KTAS	ALT AGL	REP-FT	DEP-FT	CEP-FT
HEAT	30°	500	2400	105	40	130
HEAP	30°	500	2400	105	40	130
WDU-4A/A	30°	500	2300	105	40	130

4. (C) DISPENSER MUNITIONS.

a. General. There is a large group of munitions designated as cluster bomb units (CBU) which consist of a dispenser (SUU-XX) matched with a bomblet (BLU-XX). The complete round is designated a CBU. For example, CBU-24B/B = SUU-30B/B + BLU-26/A. These munitions produce a wide variety of effects, to include antimateriel, antipersonnel, area denial, and chemical riot control. The dispenser has the capability to distribute its payload widely, thereby spreading the effectiveness of the munition over a large area instead of concentrating the destructive energy in one small area which can result in near misses or over-kills.

b. Delivery.

(1) CBU-24/49. The CBU-24/49 consists of a clam shell dispenser which opens into two hemispherical halves, allowing the bombs to fall free and disperse in a somewhat elliptical pattern. CBU-24/49's are normally delivered from a dive (25° - 45°; 5000' - 8000') at high speeds (up to 550k depending on aircraft) but may be delivered from level flight or dive toss. A CBU-24/49 pattern size is about 530x530 meters for a single dispenser but may be considerally larger if premature opening occurs. The pattern for a single dispenser normally has an area within the pattern itself that is not covered by bomblets. This is known as the "donut" effect and the size of the hole is dependent upon dispenser opening altitude. This munition is not intended for use near friendly forces.

(2) Rearward and Downward Dispensing CBU's. These CBU's comprise a major portion of our CBU inventory (i.e., CBU-14, 25, 33, 42, 46). They are normally delivered from level flight at relatively low (50'-500') altitudes and high (up to 600 knots depending on aircraft) speeds because of dispenser and optical sighting system limitations, and because this mode of delivery produces the best dispersion patterns. A-1's however, may deliver these CBU's from a dive. The resulting patterns are normally long and narrow. The length of the patterns will depend on the type of dispenser used, number of bomb button depressions during the attack, number of tubes released per depression and release airspeed. A normal CBU pattern is about 30x400 meters. Delivery can be conducted under 800'-1000' ceilings and with visibilities of 2-4 miles. The delivery should be parallel to friendly formations, with positions well marked. Delivery of CBU-25's and CBU-46's should be with the friendly forces on the right side of the aircraft to compensate for the left drift of the bomblets. Caution must be exercised in the vicinity of friendly troops near the ends of the CBU pattern, since delayed releases may extend patterns beyond desired areas. Additionally, aircraft should never fly over friendly positions once they have initiated CBU passes because some bomblets may dribble from the dispensers. The following table provides an estimate of combat delivery accuracies for CBU munitions.

MUNITION	A/C	ANGLE	KTAS	ALTITUDE AGL	REP-FT	DEP-FT	CEP-FT
CBU-24/49	All	45°	500	4500'	175	130	265
Readward and downward dispensing munitions	All	0°	450	100'	100	40	120
	All	0°	450	300'	250	70	280

5. (C) 20MM AMMUNITION.

a. General. 20mm ammunition may consist of high explosive incendiary (HEI) or armor piercing incendiary (API). The HEI projectile causes damage by blast, fragmentation and incendiary effects. At short range, HEI is effective against targets, such as vehicles, which can be penetrated due to the high striking velocity, and then destroyed by internal functioning of the explosive round. Against light vehicles, HEI is about twice as effective as API. HEI fragmentation makes it very effective against personnel. The API projectile is designed for use against armored targets, and functions with a combined penetration and incendiary effect. Against hard targets such as locomotives and armored vehicles, HEI blast is absorbed by the target surface and the deeper penetrating API round is preferred. API produces no lethal fragments and is not effective against personnel for other than a direct hit.

b. Delivery. The following table provides estimated delivery accuracies for 20MM.

AIRCRAFT	DIVE ANGLE	KTAS	SLANT RANGE-FT	CEP-FT
All	5-15°	400-500	2000'	28
All	5-15°	400-500	3000'	42

6. (U) 7.62MM AMMUNITION. 7.62mm ammunition may consist of ball or tracer rounds. The ball round is intended for use against personnel or materiel targets.

7. (C) WEAPONS MINIMUM SAFE DISTANCES. Minimum safe distances from various weapons should be provided to both the FAC directing the airstrike and the ground commander requesting an airstrike close to his forces. It is not intended here to present all the factors affecting weapons delivery accuracy; however, consideration of expected delivery accuracy, weapon lethal radius, and target identification error should provide a minimum safe distance for initial munition delivery. These distances can be reduced, but the ground commander must make that decision based upon his estimate of the immediate situation. The following table shows the minimum safe distances from unprotected troops for delivery of ordnance. The distances listed represent the range at which a fragment from the particular munition will not penetrate the skin of an individual standing in an open field. The figures are based on a probability of kill of zero (Pk=0). They do not take into account aiming errors, pattern length, or pattern dispersions. The distances are from the actual point of impact. For the BLU-3/B and the BLU-26/59/B, the figure represents the actual point of impact of a single bomblet from the CBU dispenser. The safe distance for rockets is measured from the actual point of impact for a single 2.75"FFAR. The table also shows the minimum safe distances from protected troops that various types of ordnance may be delivered. The distances offer reasonalbe casualty-free risk for troops in armored vehicles, bunkers, trenches, or fox holes who are shielded from the point

of detonation. They are based on 150% expected delivery accuracy, 200% lethal radius, 60 meters target identification error for high angle delivery, and 30 meters for low angle delivery.

MINIMUM SAFE DISTANCES

WEAPON TYPE	MINIMUM DISTANCES (METERS) PROTECTED TROOPS	UNPROTECTED TROOPS
M118 (3000#)	250	1174
MK 84 (2000#)	250	720
M117 (750#) low drag	215	830
M117 (750#) high drag	160	830
MK 82 (500#) low drag	225	700
MK 82 (500#) high drag	170	700
MK 81 (250#)	215	620
Napalm	115	---
CBU (except CBU-24/49)	110	250
* CBU-24/49	1000	1000
Rockets	215	215
Cannons and gun (20MM, 7.62MM)	45	---

* CBU-24/49 should not be used near friendly troops.

ANNEX D

NAVAL GUNFIRE SUPPORT (U)

1. (C) GENERAL.

a. Units of the US Seventh Fleet provide NGFS to US, RVNAF, and FWMAF in unilateral and combined operations in the RVN. This support has one objective - to assist the ground commander. To this end, flexibility and responsiveness to his needs are paramount. The basis of this support is the continuous presence of both qualified NGFS ships and spotting teams along the entire coast of the RVN.

b. Cruiser/Destroyer Group, 7th Fleet (CTG 70.8) provides NGFS for the four CTZs, plus the Rung Sat Special Zone. CTU 70.8.9, as the designated NGFS Unit Commander, exercises operational control and allocates ships assigned, as requested by COMUSMACV. Additional NGFS from US Coast Guard ships assigned to Coastal Surveillance Forces (TF 115) is available on request through Corps NGLOs when it does not interfere with their Market Time operations. Typical targets for NGFS are:

(1) Known or suspected infiltration points on off-shore islands and along the RVN coast.

(2) Designated SSZs.

(3) Specific targets such as enemy:

(a) Facilities, installations, and supply dumps.

(b) Command centers.

(c) Troop concentrations.

(d) Artillery, mortar, and rocket positions.

(4) Sensor activated targets.

2. (C) NGFS ORGANIZATION IN THE RVN. There are two basic organizations in the RVN designed to provide NGFS to the ground commander. In both organizations, the point of contact for NGFS is the NGLO.

a. USMC Organizations. In the USMC organizations, NGF Teams are organic and are assigned at division, regiment, and battalion level. These teams consist of Naval officers and Marine officers and enlisted men. The Naval officers operate as LOs in the FSCC and the Marine officers as spotters (FOs) with the maneuver units.

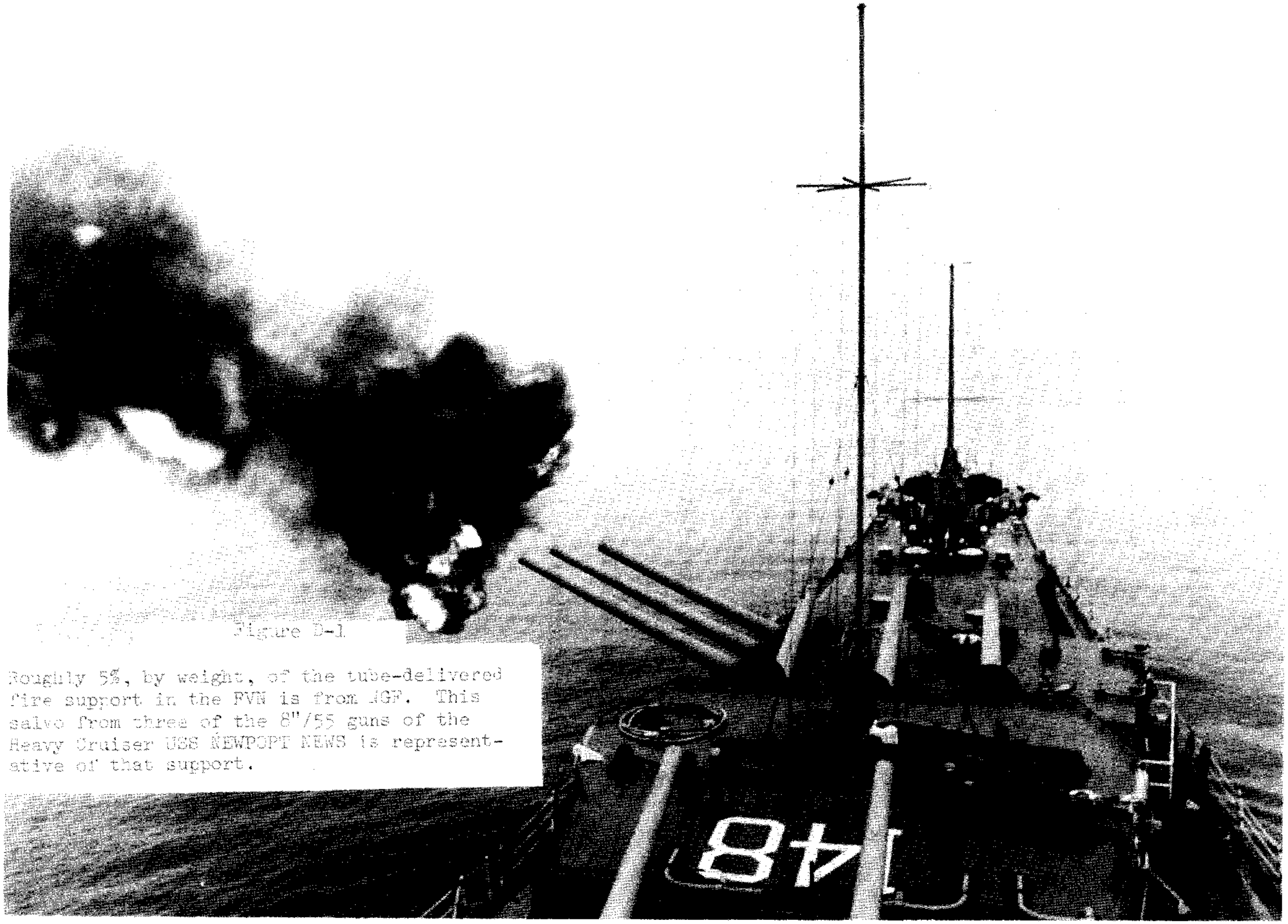


Figure D-1

Roughly 5%, by weight, of the tube-delivered fire support in the FVN is from NGF. This salvo from three of the 8"/55 guns of the Heavy Cruiser USS NEWPORT NEWS is representative of that support.

b. US Army and Other Units. Since US Army and other friendly units in the RVN do not have this organic NGFS capability, Sub-Unit ONE, First ANGLICO is present in the RVN with the mission of providing the necessary support and liaison to these units. Sub-Unit ONE, First ANGLICO, with headquarters at the MACV Annex, Tan Son Nhut, provides a corps NGLO for each ARVN CTOC and US FFORCEV headquarters TOC and NGLOs to US Army and other friendly units operating in the coastal regions of the RVN and using NGFS (see Figure D-2). Sub-Unit ONE, First ANGLICO spot teams call and adjust all NGFS for these units, as well as provide necessary liaison. Ships reporting to the corps NGLO for NGFS missions will be referred to an FSCC or a specific spot team. Spot teams, consisting of USMC enlisted personnel with a USMC officer, Naval officer, or senior enlisted man in charge, are dispersed with the supported units in the field. All NGFS missions are cleared through appropriate TOCs or FSCCs.

3. (C) NGFS PROCEDURES.

a. Forces. CTG 70.8 provides a minimum of four destroyers on a continuing basis for NGFS. In addition, one cruiser is provided for NGFS when available. Additional destroyers are assigned to augment the minimum NGFS, consistent with their availability and tactical requirements.

b. NGFS Assignment.

(1) CTU 70.8.9 issues periodic "availability messages" listing all ships in the unit and those about to report (see Figure D-3 as example.) Availability messages will include the period of assignment and the CTZ to which assigned. Assignments to CTZs are based on requirements of COMUSMACV or his designated representative.

(2) After receipt of the availability message, and at least 48 hours before scheduled arrival of a ship on NGFS station, the CG, FFORCEV/ Senior Advisor will prepare a message (see Figure D-4 as an example), assigning the ships to specific NGFS points along the coast, using coastal reference points as a guide. This message should include station assignment, spotter identification, and spotting frequencies.

(3) CTU 70.8.9 also has other missions, e.g., investigation of unidentified submarines and search and rescue. If possible, NGFS will not be interrupted until a fire mission is complete; however, CTU 70.8.9 must decide the priority in each case.

c. Reporting for NGFS Duty.

(1) Unless otherwise directed by competent authority, ships reporting for NGFS duty will arrive at designated locations by 0600H on the day of assignment. When reporting to an NGLO/spotter for the first mission it is essential that he be made aware of the ship's situation regarding capabilities and ammunition. The GURF Report is submitted via the NGLO or spotter net (see Figure D-5 for example of GURF Report). If for any reason, a ship cannot arrive at its designated station on time, CTU 70.8.9,

UNCLASSIFIED

CONFIDENTIAL

ORGANIZATIONAL RELATIONSHIP OF ANGLICO UNITS

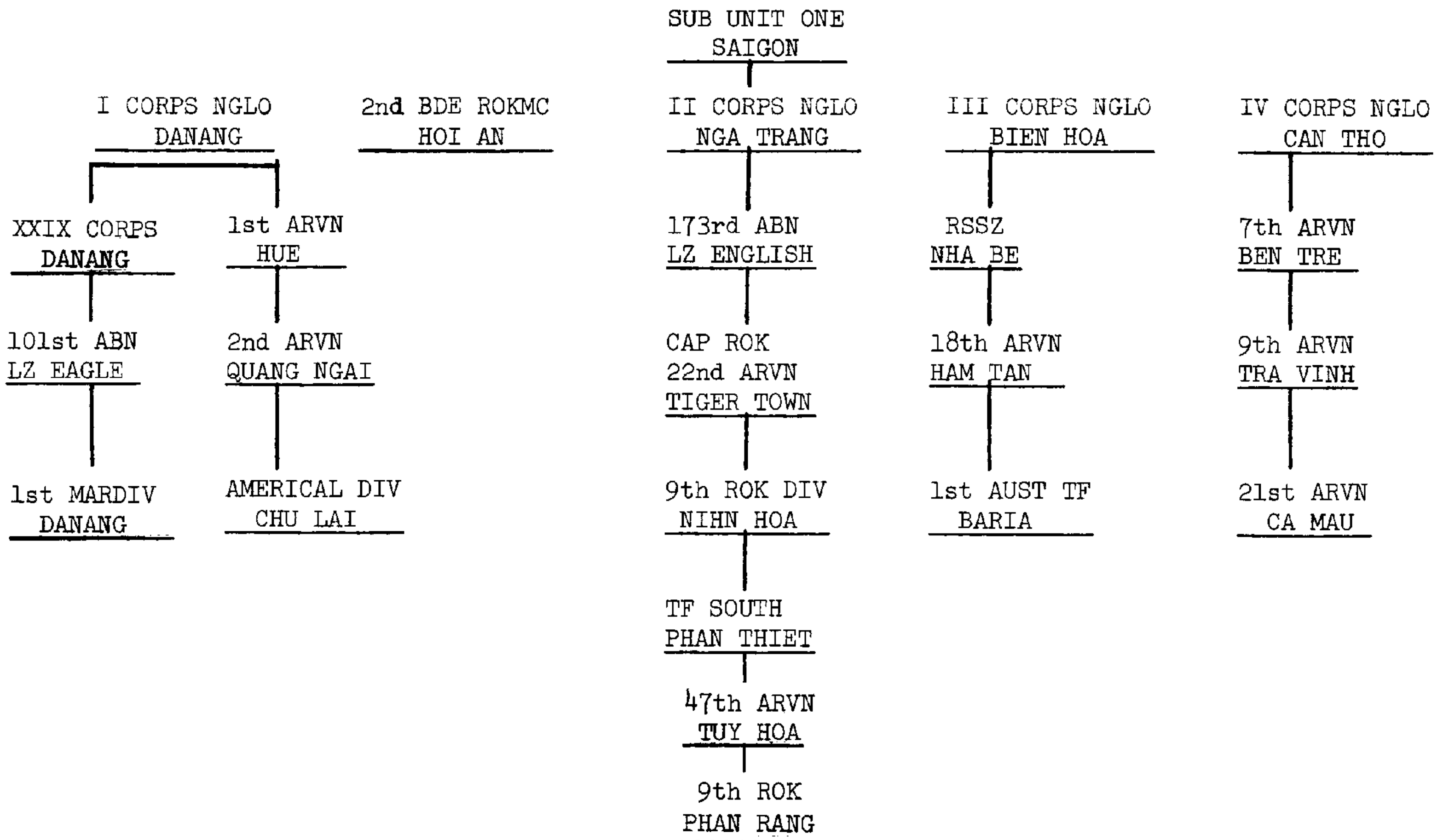


Fig. D-2

CONFIDENTIAL

UNCLASSIFIED

PERIODIC AVAILABILITY MESSAGE

IMMEDIATE
(DATE TIME GROUP)
FM: CTU 70.8.9
TO: AIG 460
INFO: (ALL SHIPS LISTED IN BODY OF MSG NOT PRESENTLY ASSIGNED TU 70.8.9 INCLUDE APPLICABLE EMBARKED STAFFS)
C O N F I D E N T I A L
A. CTU 70.8.9 (LAST AVAILABILITY MSG)
1. REF A IS SUPERSEDED AS OF 150600H.
2. SHIPS AVAILABLE AND HEREBY ASSIGNED NGFS PERIOD 160600H TO 210600H.

CTZ	SHIP	CLASS	PERIOD	EDT (NOTE 1)	NOTES
I	SAINT PAUL (CA-73)	CA	16-21 MAY	03 JUN	4
I	BLUE (DD-744)	DD-692	16-21 MAY	03 JUN	4
II	HOPEWELL (DD-681)	DD 448	16-21 MAY	03 JUN	2
II	ROGERS (DD-876)	DD 710	16-19 MAY	19 MAY	2
III	MORTON (DD-948)	DD 945	16-21 MAY	30 MAY	
IV	S.N. MOORE (DD-747)	DD 696	16-21 MAY	06 JUN	
IV	G.K. MACKENZIE (DD-836)	DD 710	16-21 MAY	24 MAY	3

GP-4
NOTES:
(1) Unless otherwise noted, ships will be available from 0600H to 0600H daily. Upon obtaining release by spotter, ships are detached without further signal on day scheduled to depart.
(2) RAP equipped.
(3) SNOOPY configured.
(4) Assigned support operation BIG SHOT until 191200H then available I CTZ.

UNCLASSIFIED

Figure D-3

II CTZ UTILIZATION MESSAGE

PRECEDENCE: IMMEDIATE (PRIORITY)
FROM: CG I FFORCEV RVN
TO: CG 22ND INF DIV QNH RVN
CG CAP ROK DIV QNH RVN
CG 9TH ROK DIV NINH RVN
CO 3/506 ABN INF
CTU SEVEN ZERO PT EIGHT PT NINE
USS (SEE NOTE 1)

INFO: MACV CC
CTG SEVEN ZERO PT EIGHT
CDR ROK FV SGN
DSA II CTZ
SR I FFORCEV LNO TO CAPT ROK DIV
CTG ONE ONE FIVE PT ONE
SR I FFORCEV LNO TO 9TH ROK DIV
SUB UNIT ONE, FIRST ANGLICO
COMSEVENTHFLT (WHEN FLAGSHIP UTILIZED)
SEVENTH AIR FORCE TACC
SUBJ: PLANNED UTILIZATION NGFS ALLOCATED II CTZ DATE TO DATE MONTH YEAR (C)
REF: A. PREVIOUS UTILIZATION MESSAGE
B. CTU 70.8.9 APPLICABLE AVAILABILITY MESSAGE
C. (AS NECESSARY)
1. REF A CANCELLED AND SUPERSEDED BY THIS MESSAGE.
2. FOR PLANNING PURPOSES, SHIPS ALLOCATED II CTZ BY REF B TENTATIVELY ASSIGNED FSA AS FOLLOWS:
A. USS_____
(1) FSA
(2) VOICE CALL OF UNIT REPORTING TO/CKT
(3) INITIAL REPORTING STATION (COASTAL REFERENCE POINT)
(4) SPECIAL INSTRUCTIONS

NOTE 1: Ships listed in body of message. Ships will proceed to area indicated unless otherwise directed by task unit commander.

Figure D-4

GUNS UP AND READY FIRE (GURF) REPORT

PRECEDENCE
DATE TIME GROUP
FM: (VOICE CALL OF SHIP)
TO: (VOICE CALL OF NGLO/SPOTTER)
C O N F I D E N T I A L (USE KAC-183)
GURF REPORT (U)
ALFA. ORIGINATOR (CALL SIGN) AND DTG OF MSG ASSIGNING SHIP TO NGFS DUTY.
BRAVO. DTG (LOCAL TIME) OF COMMENCEMENT AND END OF NGFS ASSIGNMENT.
CHARLIE. PRESENT POSIT (IN GRID COORDINATES)
DELTA. MAXIMUM RANGE OF GUNS BY BATTERY IF BELOW NEW GUN RANGE DUE TO EROSION, AND ANY REDUCED NGFS CAPABILITY REGARDING ARMAMENT LISTED IN GUN 14.
ECHO. AMMUNITION ON BOARD AVAILABLE FOR NGFS. USE CODE BELOW TO MAKE LISTING PRIOR TO ENCRYPTION.

CALIBER	PROJECTILE	POWDER
T-3/50	1-AAC (HE-MTF)	F-FULL CHG
R-5/38	2-AP	R-REDUCED CHG
M-5/54	5-COMM	
D-6" and 8"	6-HC (HE-PD)	
	7-ILLUM	
	8-VT, HE-CVT, RAP	
	11-WP	

EXAMPLE: 6R850 - INDICATES HC 5"/38, 850 ROUNDS
8T2300 - INDICATES VT 3"/50, 2300 ROUNDS
RR68 - INDICATES 5"/38 REDUCED CHARGES, 68 ROUNDS

FOXTROT. DTG (LOCAL) AND DURATION, LOCATION AND NATURE OF KNOWN OR ANTICIPATED UNREP OR PERIOD OF ABSENCE FROM GUNLINE.
HOTEL. ANY OTHER INFORMATION DETERMINED TO BE OF VALUE TO SUPPORTED UNIT.

NOTES:
(1) All groups except call signs are to be encrypted using KAK-183.
(2) Letters in paragraph echo of GURF report are first letters of code name for ammunition caliber (Durant, Richenbacker, etc.) and should also be encrypted.

Figure D-5

the unit to be supported, and the appropriate NGLO/spotter will be advised of the actual arrival time as soon as possible by an immediate precedence message.

d. Mission Request.

(1) All NGFS missions will be undertaken at the request of COMUSMACV designated representatives, CTOCs, FSCCs or responsible supported unit commanders. A fire mission request for pre-planned missions will normally originate from a corps or division NGLO. The request will pass through the CTOC/FSCC for evaluation to determine which type of fire support can best be used, i.e., NGFS, CAS, or artillery. When it is determined that NGFS is to be used the request and applicable information will be passed to the NGFS ship via the NGFS ORESTES net or Fleet Broadcast. As an alternate means, the CSC net may be used to pass requests. (See Figure D-6 for mission request format.) The CTOC/FSCC is responsible to insure that all clearances to fire have been obtained; if any doubt exists, the ship should inquire whether clearances have been completed. If requests are received by voice, or without the proper addressees, the ship is responsible for retransmission to the proper addressees. To reduce communications, mission requests should be kept brief, grouping target coordinates where possible.

(2) US forces may call for observed NGFS by the most direct channel available, i.e., NGLO/spotter nets. In the case of other friendly forces, the request must be processed through a CTOC/FSCC as outlined in paragraph (1) above.

(3) CTOCs and FSCCs will assign priorities to missions when more than one request has been made. When the requests exceed the number of ships available in a CTZ, and the importance of the mission is such that additional support is required, CTOCs or FSCCs will request assistance from COMUSMACV, who may request CTU 70.8.9 to shift NGFS assets from one CTZ to another.

e. Fire Mission Procedures. There are three types of NGFS missions in the RVN. They are the pre-planned, non-scheduled, and emergency missions.

(1) The pre-planned mission is normal for a scheduled operation where the requirement for NGFS is known for at least 48 hours in advance. The mission is requested by a ground commander as a normal fire support mission. If NGFS is selected as the best means of providing the support, the CTOC/FSCC/NGLO will submit the request by electrical means to the ship and arrange for a spotter as appropriate. (See Figure D-6 for NGFS mission request format.) The NGFS ship will notify the CTOC/FSCC and CSC when beginning the mission and when it has been completed.

(2) The non-scheduled mission corresponds to the artillery on-call

NGFS MISSION REQUEST FORMAT

The following format will be used in submitting mission requests:

PRECEDENCE:
FM: (REQUESTING ACTIVITY (NGLO/FSCC))
TO: (NGFS SHIP OR HIGHER AUTHORITY)
INFO: CTU 70.8.9
MACVCC

CLASSIFICATION (USUALLY CONFIDENTIAL)
1. TYPE OF MISSION (NON-SCHEDULED OR PRE-PLANNED).
A. TYPE OF OPERATION (AMPHIBIOUS, TROOP SUPPORT, AREA FIRE, ETC.)
B. NUMBER OF SHIPS REQUIRED/NAME OF INTENDED FIRING SHIP(S).
C. COORDINATES FOR SHIP TO REPORT TO.
D. COORDINATES OF THE TARGET OR TARGET AREA. (IF SEVERAL TARGETS IN SAME AREA, CONDENSE).
E. TIME TO BE ON STATION BY LOCAL DATE-TIME-GROUP.
F. EXPECTED DURATION ON STATION.
G. TYPE OF TARGET.
H. ANGLICO UNIT/U.S. FORCE FSCC REQUESTING MISSION.
I. FREQUENCIES BY CIRCUIT NUMBER TO BE USED AND CALL SIGN OF SPOTTER.
J. UNIT TO BE SUPPORTED/OPERATION NICKNAME.

Notes: (1) Units receiving requests for NGFS will ensure that MACVCC, COMNAVFORV, CTU 70.8.9 receive the message for information

(2) Units receiving requests for NGFS which do not have a date-time-group will assign them a date-time-group and so inform the originator.

Figure D-6

or CAS immediate mission and requires a quick-reaction response. The CTOC/FSCC/NGLO or spotter requests the mission. If not already present, the CTOC/FSCC arranges for a spotter or, if necessary, an ALO, FAC, or aerial artillery observer. The ship notifies the CTOC/FSCC and the CSC when beginning the mission and when it is completed.

(a) The senior ground commander of the supported unit may request unobserved fire when such fire is determined to be essential to the scheme of maneuver. This request will be forwarded via the appropriate CTOC/FSCC/NGLO. The CTOC/FSCC is responsible for clearances. Most requests for NGFS for battalion-sized operations fall under the non-scheduled or the emergency category and, as such, are originated by the individual spot teams, i.e., the FSCCs, rather than from the CTOCs.

(b) When the NGFS ship is not under the mission control of a US FSCC, unobserved fires may be placed on targets or target areas (exclusive of villages and hamlets) declared hostile by the GVN, VN liaison personnel, observers, or FACs where -

1. The requested NGFS mission cannot be observed due to terrain, weather, or other factors, or

2. No US NGLO/FAC/spotter is available. Because of the potential hazards of unobserved fires to friendly troops, unobserved missions not under the control of a US FSCC must be undertaken as a recognized deviation from standard procedures and only under exceptional circumstances.

(3) The emergency mission is one in which a friendly position is under attack and sufficient fire support is not available. Only a US representative of COMUSMACV may declare a fire support request as an emergency mission. Upon receipt of an emergency request, any NGFS ship in the area will proceed to the designated position at the fastest prudent speed. The US representative will immediately notify COMUSMACV, COMNAVFORV, CTG 70.8, CTF 115, CTU 70.8.9, and other commands concerned by FLASH message. This message will contain an estimate of the time the ship will be required on the emergency mission. The ship will remain in the emergency area until released by the requesting command or higher authority (see Figure D-7 for format of emergency mission request).

f. Spotting Procedures.

(1) With two exceptions, all NGFS missions will be observed; they will be controlled by US personnel only. The exceptions to observed fire are-

(a) The situations outlined in paragraphs 3e(2)(a) and (b) above, or

EMERGENCY FIRE SUPPORT REQUEST FORMAT

The following format will be used in submitting emergency mission requests:

PRECEDENCE: IMMEDIATE OR FLASH

FM:	(REQUESTING ACTIVITY)	
TO:	(NGFS SHIP OR HIGHER AUTHORITY)	
INFO:	COMUSMACV	CTG 70.8
	COMSEVENTHFLT	CTF 115
	COMNAVFORV	CTU 70.8.9
	CTF 77	MACVCC
	SUB UNIT ONE FIRST ANGLICO	

CLASSIFICATION (USUALLY CONFIDENTIAL)

NGFS MISSION REQUEST (U)

1. EMERGENCY MISSION REQUEST

A. UNIT TO BE SUPPORTED/OPERATION NICKNAME

B. NUMBER OF SHIPS REQUIRED/NAME OF INTENDED FIRING SHIP(S)

C. COORDINATES FOR SHIP TO REPORT TO

D. COORDINATES OF THE TARGET OR TARGET AREA

E. ANGLICO UNIT/U.S. FORCE FSCC REQUESTING MISSION

F. FREQ BY CIRCUIT NUMBER TO BE USED AND CALL SIGN OF SPOTTER OR OBSERVER

G. NON - U.S. SPOTTER IS (IS NOT) AUTHORIZED

UNCLASSIFIED

Figure D-7

(b) Targets in SSZs, when the senior ground commander of the force determines such fire to be essential to the scheme of maneuver.

(2) NGFS spotting teams will be used for spotting where available. ALOs, FACs, or aerial artillery observers may be used if they have been qualified by competent authority in NGFS terminology and request and spotting procedures. (NGFS spotter training may be obtained by requesting it from MACV; Sub-Unit ONE, First ANGLICO will provide the training.) When firing for these spotters, ships will assume that proper clearances have been obtained, notification to friendly troops in the area has been made, and that any necessary civilian evacuation of the target area has been done. If doubt concerning any of these assumptions exists, or if any factor arises which may indicate danger to friendly forces, the ship will question the spotter on the situation. The ship may refuse to fire if doubt or confusion remains, realizing that friendly forces ashore may be under fire.

(3) Ships may fire on designated targets in SSZs when authorized by the appropriate CTOC. Except for the situation outlined in paragraph 3f(1)(b) above, fires must be observed and may be spotted. SSZs are not considered static as they can be changed at any time by appropriate RVNAF authorities.

(4) Spotters will plan ammunition expenditures and generally will not call for 6" or larger caliber for harassment missions, in order to conserve ammunition. Normally, the shortest gun range that will accomplish the mission will be used.

(5) SNOOPY is an aerial recon vehicle which uses television configured for the QH-50 Drone helicopter and is used for surveillance and NGFS spotting.

(a) Certain destroyers are equipped to operate and receive the television signals from SNOOPY. In addition, gun cruisers have an installation for display of the television picture. SNOOPY control is line-of-site and, therefore, a function of altitude. Missions are usually flown in the coastal areas and inland to about 25 kilometers. Time available over the target is affected by the distance of the ship to the target and wind aloft. About one hour over the target can usually be expected for targets relatively close to the ship.

(b) A typical SNOOPY surveillance/spotting procedure is to approach the target at 3500 feet altitude, at which the drone will probably not be seen or heard by an unaided ground observer. When the target is properly located in the camera field, SNOOPY descends in a hover until the desired picture resolution is obtained, consistent with the recognized risk of hostile fire in the event of detection. SNOOPY may be used for spotting of naval or artillery fires and is not restricted to use by the parent destroyer. Clearance for operations over land will be obtained from the NGLO. The CTU 70.8.9 availability message will indicate those ships with a SNOOPY capability. (See NOTE 3 of Figure D-3)

4. (C) NGFS EFFECTIVENESS.

a. Liaison. There are few hard and fast rules for insuring effectiveness of NGFS. While the spotter is in the best position to determine the need for fire, the ship, through knowledge of the area and analysis of past and current missions, can determine and keep the spotter advised of the best method of delivery, type of ammunition, and the number of rounds required. Liaison among NGFS ships, NGLOs, spotters, and the supported ground commander is a must if maximum effectiveness of the support is to be realized and the unnecessary expenditure of ammunition avoided.

b. Ammunition Expenditure.

(1) Although the primary mission of CTU 70.8.9 is NGFS to the ground commander, there are indications of cases where the number of rounds fired cannot be justified by the value or the nature of the target. Also, a large number of missions have been fired without GDA of any kind.

(2) The role of unobserved harassment or interdiction fire is widely recognized and understood. These missions in many cases provide vital perimeter or approach route interdiction support to friendly forces when other means of defense are unavailable or inadequate. On such missions, a minimum ammunition expenditure consistent with the semi-continuous nature of fire is of importance to prevent extremely high ammunition expenditures with only a minimum benefit. Intelligence of actual or intended enemy movement or activity is the basic ingredient for effectiveness of fires. If harassing fire is required for an area of known enemy presence, small amounts of fire at irregular intervals, with no spotting or GDA may suffice. If, however, interdiction fire to prevent enemy use of an area is needed, spotting and GDA are essential for proper evaluation.

(3) Spotters frequently cannot observe fires or accurately determine results because of poor visibility, heavy foliage, or terrain obstructions. A complete target description and the objective of fire missions will permit the NGFS ship to assist in evaluating the target and determining the amount and type of ammunition required. Nearly any form of GDA, other than the too-frequently used "target area well covered", is desired and is useful. Later sweeps through the target area by ground forces can provide the basis for excellent GDA. Observation of enemy activity or proof of no enemy passage through commonly-used lines of communication are GDA equivalents that can be used in assessing NGFS effectiveness.

5. (C) PROTECTION OF NGFS SHIPS.

a. Ships have been fired upon by hostile forces ashore and, on occasion,

have been damaged while engaged in NGFS. The enemy is capable of seriously damaging any ship within mortar or automatic weapon range of the beach; therefore, NGFS will normally be conducted from at least 4000 meters from the beach. If the target cannot be reached from that point and it is determined that the target is worth the recognized risk, e.g., the target is a known enemy concentration or direct support of engaged friendly forces, the ship may move in closer. In unrestricted waters and when within 4000 meters of the beach, ships will usually maintain at least five knots of speed, and more if the tactical situation and navigation will permit.

b. Ships which are required to fire from inside harbors or river mouths and areas along the Rung Sat Special Zone, will usually lie to rather than anchor, ready to move at the first sign of hostile fire from shore. At night the ship will be darkened except for dim navigation lights. When wind or sea conditions preclude lying to and the target is of an urgent or emergency nature, anchoring is permitted. When anchored under these conditions, steam will be maintained, as well as a high degree of engineering and damage control readiness. The ship will get underway as soon as the emergency has subsided.

6. (U) PRECAUTIONS TO AVOID CIVILIAN OR FRIENDLY CAUSALTIES.

a. To prevent firing on friendly troops and civilians, the following minimum standard NGFS procedures are followed:

(1) Upon receipt of target coordinates, they are recorded and plotted by at least two different stations, normally CIC and Bridge, by different persons on separate charts. The coordinates are read back to the spotter for possible error.

(2) Navigational and target positions should be compared and agreed by CIC and Bridge before reporting "Ready", and at frequent intervals thereafter.

(3) The fire mission request format must be scrupulously followed. If the request is encrypted, the decrypted copy must be checked and rechecked.

(4) Any data or information repeated to the spotter must be closely monitored and checked by all concerned, particularly the NGLO.

(5) The plotting of coordinates must be monitored and rechecked.

(6) Gun-target lines must be carefully plotted and cross-checked.

(7) CIC personnel must check target locations and descriptions against the chart for possible dangerous or doubtful situations.

(8) Watch supervisors must be alert and completely aware of the situation in progress.

(9) Spotters must be questioned by the ship on any missing or questionable elements of the standard mission format.

b. In summary, every conceivable precaution must be taken to avoid endangering friendly forces or innocent civilians. Time must be secondary to accuracy. While the above precuations are stated in naval terms, the principles stressed are common to all fire support procedures. They are included here for two purposes:

(1) To acquaint the ground commander with NGFS procedures, and

(2) To stress again a statement made early in this publication - FSC in the RVN is a complex and exacting procedure.

7. (C) NAVIGATION.

a. Exact positioning is essential for accurate NGFS, but it is most difficult in some areas off the RVN coast. Long stretches of straight, sandy beach line, backed up by low marsh or rice paddies inland, provide few suitable navigation reference points. Anchoring is prohibited unless it can be done over 4,000 meters from the beach, except in extreme cases and then only as outlined in paragraph 5b above.

(1) A few AN/UPN-32 radar beacons are available in I CTZ. In some areas, lack of security for the beacon team may prevent its use; the NGLO will inform the ship if this is the case. The ultimate goal is the positioning of one AN/UPN-32 with teams throughout the country on a usable basis.

(2) A positioning buoy, made easily identifiable with radar reflectors, can be designed and built by each ship, anchored on the day of a mission, and recovered after the mission. After initial positioning and precise location of the buoy, navigation can be from that reference point. In all cases, any buoys dropped must be recovered or sunk before departing from the area.

b. A simple and effective method of obtaining a ship's position when an aerial spotter is available is to use the aircraft as a navigational aid. A "mark on top" given by the air spotter directly over some readily-identifiable terrain feature, e.g., bend in a river, crossroad, or hill, gives an approximate range and bearing to a known point.

c. The "offset tracking" method of firing can be used if there is any one feature on the beach that can be locked on with fire control radar and accurately located on the chart. This feature may be only a clump of trees, rocks, or a small hill, but it could provide the one position necessary to derive an accurate solution.

d. Known navigational reference points, easily identifiable on the chart, are sometimes not readily apparent to ships new to the area. During meetings between the ship's company and NGLOs, the in-country personnel should be questioned on aids to navigation in the area.

e. For brevity and simplicity in fire mission requests and ship-spotter radio transmission, 28 reference points along the coast of the RVN have been designated. These points are all at least 4,000 meters from the beach and in at least six fathoms of water. Their use by NGFS ships is optional and NGLOs are encouraged to evaluate these points and recommend additions or changes.

8. (C) COMMUNICATIONS.

a. The primary means of NGFS communication are simplex ORESTES circuits, HF, VHF, and FM voice nets. Frequencies and call signs are contained in CTG 70.8 Operation Order 320-(year) and will be passed to individual ships by the NGLO/spotter upon establishing communication on the NGLO/spotter cirucit; call signs should also be included in the NGFS mission request. Ships assigned to CTU 70.8.9 will monitor the NGFS ORESTES circuit, designated NGLO coordination and spotter nets, and emergency and distress frequencies. The CTOCs in each CTZ continuously monitor the NGLO net as well as their respective NGFS nets. If necessary, information can be relayed through CSCs.

b. Voice transmissions concerning NGFS missions scheduled to be conducted within the following 24 hours must be encrypted. Plans for any NGFS missions scheduled more than 24 hours later must not be discussed over insecure voice nets, whether encrypted or in the clear; such information must be transmitted over secure circuits only. Voice transmissions concerning NGFS missions need not be encrypted when the mission is to begin within 30 minutes or when the mission is already in progress.

c. Three ORESTES circuits are established for the use of CTG 70.8.9. NGFS ALFA is a simplex net for NGFS units in I CTZ. NGFS Bravo is also a simplex net and is for use by NGFS units in II, III, and IV CTZs. NGFS CHARLIE is a full duplex circuit used by CTU 70.8.9. Ships enroute to the gunline should check into the appropriate NGFS ORESTES net at 0600H the day before arrival on station, if possible.

d. VHF (FM) circuits are often used for NGFS spotter nets. To increase the capabilities of ships assigned to CTU 70.8.9, a pool of AN/VRC-46 and AN/PRC-25 transceivers has been established; this equipment is issued to NGFS units, as required, as the units are assigned to NGFS duty. The VRC-46 is a compact transceiver originally designed for vehicular field communications.

9. (C) AIRCRAFT SAFETY DURING NGFS MISSIONS.

a. NGFS ships are required to maintain an alert electronic and visual search for aircraft during fire missions. Ships will check fire if it appears that aircraft other than those assigned for spotting, will pass through, over, or near the line of fire or impact area.

b. Each CTOC will screen fire mission requests to insure that units providing NGFS or TACAIR support do not interfere with each other. To further insure flight safety -

(1) As SOP, each CTOC informs the DASC and its own Army Aviation Element of approved NGFS missions and the expected vertex (maximum ordinate) of fire.

(2) 7AF, through DASCs and CRPs, has the responsibility to notify the TACC and airfields located in coastal areas of impending NGFS missions. In addition, 7AF is responsible to notify the Director of Civil Aviation, Saigon Area Control Center, at least 30 minutes before NGFS missions which will affect airspace within five nautical miles of major air bases in coastal areas.

(3) Before each mission, the spotter should inform the NGFS ship that a "SAVAPLANE" has been issued for the mission. This is similar to a "Notice to Airman", and indicates to the ship that all appropriate aviation agencies have been notified of the impending mission. It includes the grid squares of the ship and target, the time firing is to begin, the time firing is expected to cease, and the maximum ordinate (vertex) of the projectiles. If "SAVAPLANE" information is not provided, the ship should ask the spotter whether the notice has been issued for the mission. Aircraft are required to report to the DASC of the area through which they are to fly to determine if a "SAVAPLANE" is in effect; they are required to remain clear of "SAVAPLANE" areas.

10. (C) LOGISTICS.

a. The cruisers and destroyers of CTU 70.8.9 get their logistical support through UNREP provided by specific task groups. Because of distances involved and other commitments of the task group, NGFS ships may be required to leave the gunline for considerable periods for UNREP. The question of when and how often to leave the line is sometimes difficult and no hard-and-fast rules can be made.

b. Spotters or supported commanders are seldom in a position to judge a ship's logistical requirements. Therefore, it is highly desirable that an early agreement be reached between the ship and the supported unit concerning off-the-line UNREP periods. If agreement cannot be reached, CTU 70.8.9 must be informed early enough to take appropriate action.

c. Ships do not leave the gunline for UNREP simply because services are available; such actions are not within the spirit of NGFS responsiveness to the ground commander. CTU 70.8.9 ships are authorized direct communication with the logistical task group in all matters relating to UNREP. Every effort is made to forecast requirements to permit orderly planning for UNREP to avoid high-speed, disrupting transits for emergency UNREP. Ships coordinate UNREP planning with NGLO/spotter and use the fastest prudent speed for transits to and from UNREP.

d. To insure an ammunition reserve for self defense and emergencies, whenever any type of gun ammunition is expended to 25% of allowance, that type will be placed in emergency-use-only status. CTU 70.8.9 and NGLO/spotters should be notified at that time. CTU 70.8.9 may waive the emergency-use-only restriction when the situatuon warrants.

11. (C) DEPARTURE FROM THE NGFS AREA.

a. Ships will notify the supported unit spotter as early as possible, and not later than 12 hours before departure, of required time of departure for UNREP and the estimated time away from station. In case of emergency or high-priority fire mission, ships will modify times of departure or return or, if necessary, cancel any UNREP, except for an emergency requirement.

b. Not later than 12 hours before final departure from station, ships will notify the supported unit spotter of expected time of departure and whether a relief ship is available. A ship will not depart from its station until completion of any mission that may be in progress and until release by the spotter has been obtained. If a release by the spotter cannot be obtained, CTU 70.8.9 must be informed early enough to take appropriate action.

12. (U) SHIP, GUN, AND AMMUNITION CHARACTERISTICS. The diversity of ships, guns, and ammunition used in providing NGFS offers considerable flexibility, both to the gunline and ground commanders. Certain characteristics of these items which may be of interest, particularly to ground commanders, are included as Appendixes 1, and 2.

Appendixes:

1. Characteristics of NGFS Ships
2. Characteristics of Naval Ammunition

APPENDIX 1

CHARACTERISTICS OF NAVAL GUNFIRE SUPPORT SHIPS

(C) Ships assigned to naval gunfire support are basically of two types- cruisers or destroyers. To assist personnel ashore, the class of the ship will be included in the availability message. It must be emphasized that ammunition figures are approximate and will vary from ship to ship in a class. Also, the maximum horizontal range listed is that computed using standard conditions and new barrels. Day to day maximum ranges will vary considerably, depending upon bore wear and environmental conditions. The following is a list of ships by class providing NGFS in the RVN.

GUNS	MAXIMUM HORIZONTAL RANGE IN METERS	AMMO CAPACITY (Rounds)	RATE OF FIRE (Rds/gun/min)
HEAVY CRUISER (CA) NEWPORT NEWS			
9 8"/55	27,400	1,450	10
12 5"/38	16,500	5,800	15
4 3"/50	12,800	8,000	50
Draft - 27'	Length - 717'	Beam - 76'	
HEAVY CRUISER (CA) SAINT PAUL			
9 8"/55	27,400	1,450	3
10 5"/38	16,500	4,520	15
14 3"/50	12,800	9,060	50
Draft - 26'	Length - 675'	Beam - 71'	
HEAVY CRUISER (CA) BOSTON/CANBERRA			
6 8"/55	27,400	956	3
10 5"/38	16,500	4,300	15
8 3"/50	12,800	6,548	50
Draft - 27'	Length - 673'	Beam - 76'	

GUNS	MAXIMUM HORIZONTAL RANGE IN METERS	AMMO CAPACITY (Rounds)	RATE OF FIRE (Rds/gun/min)
GUIDED MISSILE LIGHT CRUISER (CLG) GALVESTON			
6 6"/47	21,100	1,700	10
6 5"/38	16,500	3,000	15
	Draft - 26' Length - 608' Beam - 63'		
GUIDED MISSILE LIGHT CRUISER (CLG) OKLAHOMA CITY/PROVIDENCE			
3 6"/47	21,100	1,000/1,500	10
2 5"/38	16,500	1,500/1,700	15
	Draft - 26' Length - 610' Beam - 65'		
DESTROYER (DD) 445			
2 5"/38	16,500	720	15
4 3"/50	12,800	2,150	50
	Draft - 17' Length - 376' Beam 40'		
DESTROYER (DD) 448			
4 5"/38	16,500	2,200	15
6 3"/50	12,800	3,500	50
	Draft - 18' Length - 376' Beam - 40'		
Note - PORTERFIELD and WEDDERBURN have 5 5"/38 and no 3"/50			
DESTROYER (DD) 696			
6 5"/38	16,500	2,300	15
4 3"/50	12,800	2,300	50
	Draft - 20' Length - 376' Beam - 41'		

GUNS	MAXIMUM HORIZONTAL RANGE IN METERS	AMMO CAPACITY (Rounds)	RATE OF FIRE (Rds/gun/min)
	DESTROYER (DD) 931/945 CLASS		
3 5"/54	23,800	1,800	35
4 3"/50	12,800	2,400	50
	Draft - 22' Length - 418' Beam - 45'		
	DESTROYER (DD) 446 (FRAM II)		
2 5"/38	16,500	780	15
	Draft - 20' Length - 376' Beam - 40'		
	DESTROYER (DD)692/805/713 (FRAM II & DDR)		
6 5"/38	16,500	2,300	15
	Draft - 20' Length - 376' Beam - 41'		
	DESTROYER (DD)710 FRAM I/DD 764 FRAM II		
4 5"/38	16,500	1,700	15
	Draft - 21' Length - 390' Beam - 41'		
	GUIDED MISSILE DESTROYER (DDG) 2 CLASS		
2 5"/54	23,800	1,200	35
	Draft - 22' Length - 437' Beam - 47'		
	GUIDED MISSILE DESTROYER (DDG) 31 CLASS		
1 5"/54	23,800	600	35
4 3"/50	12,800	2,400	50
	Draft - 22' Length - 418' Beam - 45'		

GUNS	MAXIMUM HORIZONTAL RANGE IN METERS	AMMO CAPACITY (Rounds)	RATE OF FIRE (Rds/gun/min)
	ESCORT SHIP (DE) 1033 CLASS		
2 3"/50	12,800	604	50
	Draft - 18' Length - 312' Beam - 39'		
	ESCORT SHIP (DE) 1037 CLASS		
3 3"/50	12,800	905	50
	Draft - 25' Length - 372' Beam - 41'		
	ESCORT SHIP (DE) 1040 CLASS		
2 5"/38	16,500	1,304	15
	Draft - 26' Length - 415' Beam - 44'		
	GUIDED MISSILE ESCORT SHIP (DEG) 1 CLASS		
1 5"/38	16,500	350	15
	Draft - 25' Length - 415' Beam - 44'		
	RADAR PICKET ESCORT SHIP (DER)		
2 3"/50	12,800	1,200	20
	Draft - 16' Length - 306' Beam - 36'		
	GUIDED MISSILE FRIGATE (DLG) 9 CLASS		
1 5"/54	23,800	600	35
4 3"/50	12,800	2,400	50
	Draft - 24' Length - 512' Beam - 52'		

GUNS	MAXIMUM HORIZONTAL RANGE IN METERS	AMMO CAPACITY (Rounds)	RATE OF FIRE (Rds/gun/min)
GUIDED MISSILE FRIGATE (DLG) 26 CLASS			
1 5"/54	23,800	600	35
2 3"/50	12,800	1,200	50
	Draft - 29' Length - 547' Beam - 54'		
COAST GUARD 311' HIGH ENDURANCE CUTTER (WHEC)			
1 5"/38	16,500	400	15
	Draft - 13' Length - 311' Beam - 41'		
COAST GUARD 378' HIGH ENDURANCE CUTTER (WHEC)			
1 5"/38	16,500	400	15
	Draft - 19' Length - 378' Beam - 42'		

Note 1: Optimum ammunition break down is approximately as follows:
8" and 6" - 90% HC, 10% AP
5" - 45% HE, 40% VT, 10% ILL, 5% COMM, up to 100 WP
3" - 55% VT, 35% HC, 10% AP

Note 2: 5" HE percentage is based on combined total of HC/AAC/HE-PD. VT load should be broken down as follows:
60% HE-CVT
30% VT-NSD
10% VT-SD

Note 3: There are currently no specific restrictions on ammo expenditures or loading criteria. However, the limited reserves of all types of ammunition dictate that prudence should continue to be exercised in expenditure. For economy consideration, the expenditure of the less expensive HC/HE-PD is preferred to AAC for surface bursts when operationally feasible. This is particularly applicable to 5"/54 AAC.

Note 4: A limitation of the 5"/54 gun, of which spotters must be made aware, is the inability to shift ammo types rapidly. The loading system of the 5"/54 gun is fully automatic. Although projectiles can be and often are loaded into the drum room in the magazine, the first of these is not rammed until 47 other rounds have been fired. Therefore, unless a ship has ample warning

that a special projectile (ILL/WP) will be required, a delay of 20 - 30 minutes can be expected. This can be avoided if only one gun is prepared for special projectiles, but this may limit the number of HE rounds per salvo.

UNCLASSIFIED

UNCLASSIFIED

APPENDIX 2

CHARACTERISTICS OF NAVAL AMMUNITION

1. Naval guns have a high initial velocity which results in a high striking velocity and a flat trajectory at short ranges. Such guns are particularly effective against targets presenting a nearly perpendicular face to the line of fire. A high initial velocity can be a disadvantage when plunging or defilading fire is required; however, this disadvantage can be overcome by either opening the range or using reduced charges. Reduced charges will reduce the miximum effective range of the gun by 20% to 50% and the fire control problem will be somewhat more complicated.

2. The normal pattern of salvos fired from Naval guns is long and narrow. This permits the most effective coverage when the long axis of the target is parallel to the line of fire.

3. When a projectile explodes, its case yields under the pressure until it fails and breaks up into sharp-edged fragments. The majority of damaging fragments come from the side walls of the projectile and are concentrated principally in a narrow zone known as the side spray. The angle of the side spray is a function of the fuze delay and the angle of fall of the projectile. A quick fuze and low angle of fall will produce a side spray almost perpendicular to the line of fire while a fuze delay and a high angle of fall will concentrate the fragments almost parallel to the line of fire.

4. Charge-to-weight ratio and size of the projectile also influence the fragmentation pattern. A high charge-to-weight ratio will yield fragments with a high velocity while a lower charge-to-weight ratio will yield larger fragments. Fragmentation efficiency will vary with the square root of the projectile payload weight. Illustrations of typical fragmentation patterns are shown on the last page of this appendix.

5. Range and Vertex data

a. Full Charge.

GUN	PROJECTILE	MAXIMUM RANGE IN METERS	MAXIMUM RANGE VERTEX IN FEET	EFFECTIVE RANGE IN METERS	EFFECTIVE RANGE VERTEX IN FEET
8"/55	AP	27,890	28,880	20,115	8,136
	HC	27,760	30,028	20,115	7,590
6"/47	AP	23,882	27,190	16,460	5,980
	HC	27,760	24,806	15,545	5,928
5"/54	HC	23,691	27,680	16,460	6,305
5"/38	AAC	15,790	18,000	13,715	7,969
	HC	15,904	17,890	13,715	7,969
3"/50	AA	11,965	13,460	10,060	5,015

Note: Effective Range = 70% Maximum Range

GUN	PROJECTILE	MAXIMUM RANGE IN METERS	MAXIMUM RANGE VERTEX IN FEET	EFFECTIVE RANGE IN METERS	EFFECTIVE RANGE VERTEX IN FEET
b. Reduced Charge.					
8"/55	HC	21,408	22,076	15,085	5,570
	AP	20,420	20,010	18,295	4,920
6"/47	HC	18,395	18,280	11,885	4,140
	AP	17,307	19,380	12,800	4,660
5"/54	HC	UNK	UNK	10,000	UNK
5"/38	AAC	8,114	7,507	5,485	1,645

Note: Effective Range = 70% Maximum Range

6. Projectiles and Fuzes for Shore Targets

Target	Ship's Guns	Recommended Projectile and Fuzes
Heavy concrete fortification	8 inch to 6 inch	AP
	5 inch and smaller	HC (PDF) (Note 1)
Light concrete or log and/or earth fortifications, strong masonry buildings	8 inch	HC (PDF) (Nose Plug)
	6 inch & 3 inch	AP (Note 2)
	5 inch	COM (Note 2)
Dispersed targets in open such as parked aircraft, vehicles, personnel, light huts, etc.	8 inch to 5 inch	HC (PDF), AAC, or VT (Note 3)
	5 inch	HC (VTF, MTF or PDF) (Note 3)
Large targets of light construction such as oil tanks, hangars, factory buildings, etc.	8 inch to 5 inch	HC (PDF & Nose Plug)
Landing field runways and roads, paved or unpaved	8 inch to 5 inch	HC (Nose Plug)

Note 1: Projectile will not cause appreciable damage except to exposed personnel and equipment close to burst.

Note 2: Projectile not particularly effective against this target but is recommended since a non-delay fuzed projectile would be less effective.

Note 3: MTF should be set to obtain low level air bursts. If height of burst can be accurately controlled, MTF will be preferable to PDF. If VT action desired, use VT-NSD, HE-CVT or APP.

Note 4: To ensure fuze quick reliability, 5"/54 ships using HF-PD projectiles must set fuze safe screw to the "ON" position prior to loading projectile in loader drum.

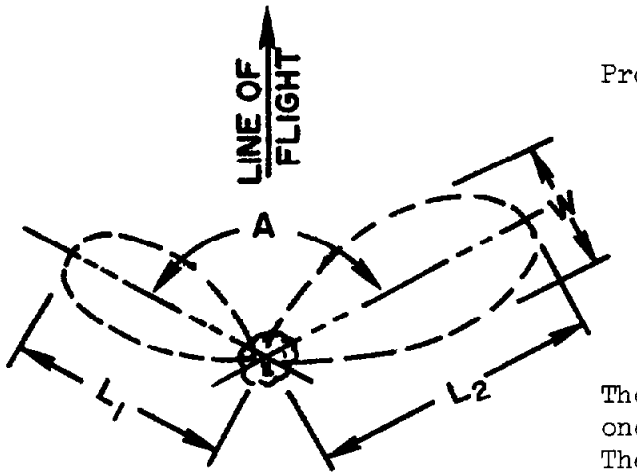
7. Projectile Travel During Delay Time of Base Fuze.

Projectile	Fuze Delay (SEC)	Maximum Projectile Travel (feet)
3"/50 AP	.016	13-24
6"/47/8"/55 AP	.033	38-60
5"/38/5"/54 COM	.010	9-17
8"/55 HC (full chg)	.010	13-20
8"/55 HC (Reduced chg)	.010	12-16

8. (C) Rocket Assisted Projectile. This ammunition (usually referred to as "RAP") is designed for use against personnel and light structures. Its destructive capability is limited because of its small buster charge - only 3.3 lbs. Effectiveness results from increased fragmentation from cast projectile body. A significant advantage of RAP is its increased range, but with somewhat decreased accuracy, as shown in the table below.

		MAXIMUM RANGE IN METERS		MAXIMUM RANGE VERTEX IN FEET	
GUN	PROJECTILE	RAP	Non-RAP (Full Charge)	RAP	Non-RAP (Full Charge)
5"/54	HC	31,090	23,691	34,000	28,000
5"/38	HC	23,774	15,904	34,300	17,890

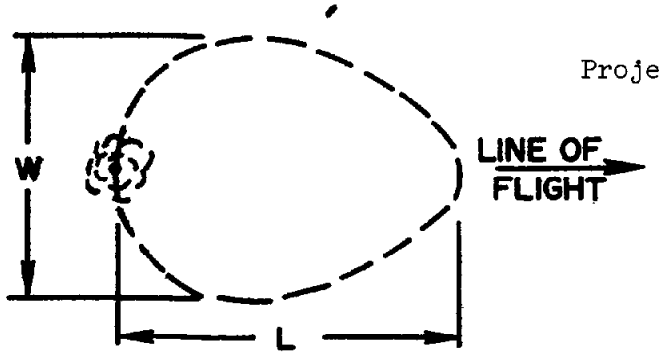
FRAGMENT PATTERNS



Projectile	L_1 (Meters)	L_2 (meters)	W (meters)	A (degrees)
5"	110-206	137-275	14-27	100-125
6"	146-293	206-407	14-32	105-130
8"	250-455	365-640	14-37	110-135

The immediate and "effective" pattern is about one-eighth of the nearer portion of each lobe. The remainder of the pattern is formed by fragments which fall slightly later.

Approximate Fragment Patterns Made on Water By Service-Loaded HC Projectiles Fuzed With PDF's



Projectile	L (meters	W (meters)
5"	69-137	64-108
6"	114-230	87-155
8"	185-410	137-250

Approximate Fragment Pattern Made on Water By Service-Loaded HC Projectiles Fuzed With BDF's

ANNEX E

COMBINED FIRE SUPPORT COORDINATION CENTERS (U)

1. (U) INTRODUCTION. The tactical situation in the RVN is unique in many respects and requires modification of doctrine, to some degree, and considerable modification of classical textbook procedures. The CFSCC is an example of the adaptation of procedures to a unique situation.

a. Some factors which complicate FSC in the RVN were discussed in the early paragraphs of this publication. The existance of these factors, coupled with the need to share US expertise in FSC with RVNAF, strongly recommends the consideration of CFSCCs and their adoption where warranted.

b. A CFSCC is an FSCC in which RVNAF and US personnel and facilities are collocated and work side-by-side toward the same objective.

2. (C) CFSCCs NOW OPERATIONAL. As of October 1969, there were ten CFSCCs in operation in the RVN and others were planned as follows:

a. I CTZ - One being planned in Quang Tri province

b. II CTZ - Operational:

Ban Me Thout
Kontum
Nha Trang
Phan Rang
Phan Thiet
Pleiku
Qui Khon
Tan Canh
Tuy Hoa

Being Planned:

LZ English
LZ Uplift

c. III CTZ - Operational:

Tan An

Being Planned:

Tay Ninh province
Hau Nghia province

d. IV CTZ - None

3. (C) DISCUSSION OF CFSCCs.

a. Experience to date in those parts of the TAOI of the 25th US Infantry Division where there is no CFSCC indicates that ARVN units do

not request fire support routinely unless liaison personnel or some other form of quick fire channel is provided. Experience has likewise shown that the CFSCC is a means of providing RVNAF and US forces with ready access to all fire support available in the area serviced by the CFSCC. Additional benefits which result from CFSCCs in the 25th US Division TAOI are faster fire clearances, faster response to fire requests, and the provision of refinements such as electronic manipulation of meterorological data and radar registration to ARVN artillery units. The CFSCCs also provide a system which can remain in operation in the event that US artillery units are redeployed.

b. The underlying concept of the CFSCC is sound but each case must be evaluated on its own merits. Some advantages which can result from CFSCCs are:

(1) Improved coordination and effectiveness of fires available within a given area.

(2) Increased requests for available fires as experience and confidence are developed, particularly by RVN territorial forces.

(3) Shortened reaction time to fire requests, due to more efficient clearance procedures and less language difficulties.

(4) Improved training in fire support procedures and techniques for RVNAF personnel.

(5) Greater area coverage and density of fire support for supported forces.

(6) Improved interchange of intelligence information.

(7) Centralization of clearances to fire and the removal of much of this burden from FDCs.

(8) Increased safety through the coordination of information on friendly locations.

(9) Improved exchange of air warning information.

(10) Increased mutual understanding and respect among allied forces.

(11) Increased (back-up) communications channels over those normally available.

c. Some disadvantages that can result from CFSCCs are:

(1) Diversion of TOE resources, as TOEs do not provide for staffing and equipping CFSCCs. Providing these assets from organic resources may degrade some other functions of the fire support mission.

(2) Reduction in smoothness of working relationships. Supported units usually prefer to work habitually with the same supporting artillery, and thereby develop smooth working relationships.

(3) Possible generation of RVNAF distrust of US motives in establishing CFSCCs, including a feeling that the US is trying to dominate the RVNAF.

(4) Possible generation of overreliance by RVNAF on US fire support.

d. As TOE assest are not specifically provided for CFSCCs, their establishment without due consideration of the need for them could severely tax the organic resources of fire support units. There is no standard organization or operating proceedures for CFSCCs that are entirely appropriate for all areas in the RVN. As corps and subordinate levels in the RVN operate TOCs with FSCCs as a normal part of the organizational structure, strong consideration should be given to integrating CFSCCs into TOCs. The primary function of the CFSCC is to coordinate the fires of one or more national forces within a given area. Savings in manpower and equipment may well result by making the CFSCC another element of the TOC, even at province level. An additional advantage might accrue in closer coordination among fire support and maneuver elements, and among maneuver elements themselves, as well as eliminating the need for electrical communications links between CFSCCs and maneuver forces to clear fires.

e. In general, the advantages which might accrue as a result of establishing CFSCCs outweigh the disadvantages. US commanders are encouraged to invite the participation of local RVN officials and RVNAF commanders in establishing CFSCCs -

(1) Where the need for them exists.

(2) Where resources permit.

(3) Where areas of coverage coincide with political boundaries, or as dictated by the situation.

(4) With due consideration of including the CFSCC as another element of the TOC.

4. (C) LONG AN PROVINCE CFSCC.

a. The Long An Province CFSCC, located in Tan An in southern III

CTZ, was established in July 1969 through the joint efforts of the Long An Province Chief and the CO, 3rd Brigade, 9th Infantry Division.* The active and enthusiastic support of the CG, 25th ARVN Division also directly contributed to getting the center off to a good start. It was conceived and established to fill a recognized need for better fire support coordination within the province. Major factors that appealed to both US and RVNAF were that it would be a province facility, operating under the control of the province chief, and that the fires available, both US and RVNAF, could thus be more fully and efficiently used. Artillery coverage extends over 80% of the province land area and over 95% of the population. The primary purpose of this CFSCC is coordination and fire clearances. In actuality, the center is a joint CFSCC, as the fires of more than one service of both the US and the RVN are coordinated in the center. Representatives of several services of both nations form the staff of the center.

b. The situation in Long An Province is more nearly ideal for a CFSCC than will be found in many other provinces. Long An is comparatively small in area; the TAORs of the major units (3rd Brigade of the 9th US Infantry Division and the 46th and 50th ARVN regiments) are within the province boundaries. Collocation of the 3rd Brigade Headquarters, the 2/4 FA Battalion Headquarters, and Province Headquarters in Tan An also tends to make Long An Province ideal for a CFSCC. The center itself is physically located next door to the Long An Province TOC.

c. The organization of the CFSCC is as outlined in the SOP at Appendix 1 and includes US personnel from the 2/4 FA Battalion, ARVN personnel from the 253 Artillery Battalion, naval personel from both the US and Vietnamese Navies, and both US and Vietnamese AF (FAC) personnel. US artillery personnel includes one officer and six enlisted men, most of whom come from the FDC of the 2/4 FA Battalion. The battalion FDC must also remain operational, so it is augmented by other personnel to compensate for those personnel lost to the CFSCC. The CFSCC operates around-the-clock, in two shifts of 12 hours each.

d. Basic equipment used in the CFSCC includes several telephones, six radios, one 10-KW generator, two 2-KW generators, one 1/4-ton truck, and assorted furniture and plotting equipment. This equipment is all provided by the 2/4 FA Battalion from organic resources, with the

*The 9th Div was redeployed in Jul-Aug 1969. Its 3rd Bde remained in the RVN and was attached to the 25th US Infantry Division, giving the 25th Div four brigades.

exception of AF radios which are part of the FAC equipment. The CFSCC hopes to obtain a UHF radio for direct monitoring of SLAR and Red Haze targets; these targets are now received by the 2/4 FA Battalion and relayed to the CFSCC.

e. Artillery within Long An Province which can be coordinated by the CFSCC includes:

4 US 105mm batteries (direct support)
2 US 155mm batteries (general support, reinforcing)
3 ARVN 105mm batteries (direct support)
2 ARVN 155mm platoons (general support)
One 8"/175mm platoon in general support of IV Corps
(The CFSCC does not coordinate its fires, but may refer targets to it when out of range of the other artillery.)

Requests for fire from US or ARVN units are processed in the CFSCC and any available artillery may be tasked with the fire mission. Requests for fire from Territorial Forces go through the District Chief, who has the option of going direct to ARVN artillery or to the CFSCC.

f. All targets developed by intelligence funnel into the CFSCC. They may come from sub-sector, sector, ARVN artillery, US artillery, the 2/4 FA Battalion FDC, or the 3rd Brigade, 9th Inf Div S-2.

g. Some specific advantages and disadvantages connected with the Long An Province CFSCC are listed below. These supplement the general advantages and disadvantages discussed earlier.

(1) Advantages.

(a) The CFSCC provides an excellent vehicle for training RVNAF personnel in US fire support techniques.

(b) The CFSCC provides a means of encouraging ARVN and province officials to coordinate better, not only with US forces, but also between themselves.

(c) The CFSCC provides meterological data and radar registration which gives technical practice and proficiency to ARVN artillery which is otherwise not available.

(d) The CFSCC speeds clearances to fire and FDCs are largely relieved of clearance functions.

(e) There is an incalculable benefit in the collection

and dissemination of intelligence. The CFSCC has become an auxiliary intelligence clearing house.

(2) The principal disadvantage has been the difficulty of securing personnel and equipment, not provided by TOE, to build and operate the CFSCC.

g. Some measure of the success of the Long An CFSCC can be seen in the support that US artillery units has been able to provide to ARVN and Territorial Forces in the province. In August and September of 1969, US artillery units fired 170 such missions; this is in comparison to 82 similar missions in the other three brigade areas in the division TAOI (outside Long An Province). These totals do not include artillery support of the numerous combined operations in the area, nor do they necessarily show increased ARVN dependence on US fire support. ARVN units as well have been called upon more frequently for fire support. The decision as to which unit(s) will fire is made in the combined center, and it is not unusual for a single action to be supported by both ARVN and US artillery.

5. (U) OTHER CFSCCs. In contrast to the Long An CFSCC, those in II CTZ, while similar in function and operation to the Long An center, do not service areas which coincide with province boundaries. The comparatively large size of most provinces in II CTZ tends to make province CFSCCs impractical. In II CTZ, the establishment of combined centers was in response to the need to extend fire support coverage, due to the large land area and relatively scarce fire support assets available. Clearances to fire are less of a problem in II CTZ than in III CTZ, because of less population density. Artillery in II CTZ is more concentrated in "pockets" to protect population centers and lines of communication. Much of the ARVN artillery in II CTZ has a territorial defense role and US artillery in the CTZ fires a higher proportion in support of ARVN forces than in any other CTZ. As in Long An Province, the CFSCCs in II CTZ serve the purpose well for which they were established.

Appendix:

1. SOP, Long An CFSCC

2d Bn 4th FA
Tan An, RVN
23 Sep 1969

STANDING OPERATING PROCEDURES

COMBINED FIRE SUPPORT COORDINATION CENTER

1. GENERAL

a. Purpose: The purpose of this Standing Operating Procedure is to establish the responsibilities of the duty personnel in the Combined Fire Support Coordination Center, and to establish procedures to be utilized in performing their assigned functions.

b. Evaluation: The established organization, responsibilities, functions and procedures outlined in this Standing Operating Procedure are based on present requirements and the experience of actual operation. These procedures should be evaluated, and as the requirements change and experience reveals improved procedures, the Standing Operating Procedures should be updated to include the most current information.

2. ORGANIZATION AND RESPONSIBILITIES

a. The CFSCC will be organized to include the following personnel:

(1) ARVN Artillery Liaison Section.

(2) VN and US Naval representatives.

(3) VN and US Air Force representatives.

(4) US Artillery Liaison Section.

b. Responsibilities:

(1) ARVN Artillery Liaison Section:

(a) Duty Officer:

1. Is responsible for all operations performed by ARVN Artillery Liaison Section

2. Will be present for duty in the CFSCC to effect necessary coordination with the US Artillery and the Naval and Air Force.

3. Is responsible for maintaining current information on maps and charts.

4. Is responsible for the conduct and appearance of the section's duty personnel and their area in the CFSCC.

(b) Radio/Telephone Operator:

1. Is responsible for continuously monitoring his radio, and receiving and sending messages as required by the Duty Officer.

2. Is responsible for relaying requests for fire to firing units as directed by the Duty Officer.

3. Is responsible for obtaining AWCC data from the firing elements and passing it to the US Artillery Liaison section for broadcast.

(2) Naval Representatives:

(a) VN and US Naval representatives are responsible for monitoring their respective operations and keeping the CFSCC personnel continuously advised of Naval activities and any requirement for fire support.

(b) Are responsible for obtaining Naval clearances as requested.

(c) Are responsible for coordinating Naval support as requested.

(3) Air Force Representatives:

(a) VN and US Air Force representatives are responsible for monitoring their respective operations and keeping the CFSCC continuously advised of Air Force activities and any requirements for fire support.

(b) Are responsible for coordinating Air Force support as requested.

(4) US Artillery Liaison Section:

(a) Duty Officer:

1. Is responsible for all operations performed by US Artillery Liaison Section.

2. Will be present for duty in the CFSCC to effect necessary coordination with the ARVN Artillery, and the Naval and Air Force representatives.

3. Is responsible for maintaining current information on maps and charts.

4. Is responsible for the conduct and appearance of

section's duty personnel and their area in the CFSCC.

(b) Section Chief:

1. Is responsible for performing the duties assigned to him by the Duty Officer.

2. Is the senior enlisted man in the Liaison section.

3. Must be able to perform the duties of the Duty Officer in his absence.

4. Must have a thorough knowledge of the Rules of Engagement.

(c) Team Leader:

1. Is responsible for performing all duties assigned to him by the Duty Officer and Section Chief.

2. Is the senior enlisted man on his team.

3. Must be able to perform the duties of the Section Chief.

4. Must have a thorough knowledge of the Rules of Engagement.

(d) Radio/Telephone Operator:

1. Is responsible for continuously monitoring his radio, and receiving and sending information as required by the Duty Officer.

2. Is responsible for obtaining all clearances as directed by the Team Chief.

3. Is responsible for knowing the duties of all personnel within the team.

4. Is responsible, when directed, for plotting all radar, SLAR, and Red Haze targets on the target overlay.

5. Must have a thorough knowledge of the Rules of Engagement.

3. FUNCTIONS OF THE CFSCC

a. The CFSCC has been established to accomplish the following missions:

(1) To coordinate ARVN and US Artillery for the territorial defense of Long An Province.

(2) To provide Liaison to the Province to coordinate fire support for ARVN/GVN operations.

(3) To coordinate information among the artillery elements utilized in support of ARVN, GVN and US forces.

b. To accomplish the missions of the CFSCC, the following functions will be performed:

(1) The CFSCC will obtain clearances as requested by the ARVN and US artillery based on the established Rules of Engagement. Those clearances will include ARVN, GVN, US and Naval clearances as required.

(a) When ARVN, GVN, US forces need additional fire support.

(b) When ARVN artillery is the only fire support available to US forces, and when US artillery is the only fire support available to ARVN or GVN forces.

(c) When the attack of a target requires all available fire within range.

(3) The CFSCC will record and report all radar, SLAR and Red Haze targets.

(4) The CFSCC will pass intelligence to the appropriate personnel when it is received. Upon request, the CFSCC will coordinate the attack of their targets.

(5) The CFSCC will coordinate preplanned fires for ARVN, GVN, and US forces as requested.

(6) The CFSCC will provide liaison between Sector and the US forces for miscellaneous coordination and the passing of information.

4. PROCEDURES

a. General:

(1) In order to perform the functions as indicated above, the CFSCC will use the procedures listed in this section.

(2) In cases where there is more than one procedure that can be utilized, the quickest method will be used.

b. Clearances:

(1) Request for target clearances may come from any of the following sources.

(a) US Brigade and Battalion Artillery Liaison Sections.

(b) Direct Support Artillery Battalion FDC.

(c) Naval Operations Center.

(d) VN and US Air Force Liaison Sections.

(e) ARVN Artillery Liaison Sections and FDC's.

(f) Any other FWMAF needing artillery support.

(2) When the target is received, it will be plotted on the operations map which will have all current areas of operation plotted on it. At that time, it will be determined what clearances are required by the Rules of Engagements.

(3) Procedures for obtaining clearances:

(a) ARVN Clearance.

1. US Duty Personnel will call the ARVN unit's headquarters on the ARVN Advisor's frequency and request clearance.

2. An alternate method will be to fill out a request for clearance form (Incl 1) and give it to the Sector Duty Officer. He will in turn call to the ARVN unit's Duty Officer and request clearance. This can be accomplished on land line or radio.

(b) GVN Clearance.

1. US Duty Personnel will call to the District Advisor's frequency and request clearance.

2. An alternate method will be to fill out a request for clearance form and give it to the Sector Duty Officer. He will then call the District concerned on radio and obtain their clearance.

(c) Naval Clearance.

1. The US Duty Personnel will give the target to be cleared to the Naval representative in the CFSCC. He will then call to the Naval element concerned and request clearance.

2. An alternate method will be for the duty personnel receiving the target to call directly to the Naval element concerned.

(d) US Clearance.

1. The ARVN Artillery Duty Officer will fill out a request for clearance form and give it to the US Duty Personnel.

2. The US Duty Personnel will call the US Artillery Liaison Section concerned on the CFSCC frequency or on land line. The artillery liaison section will then obtain the clearance from the US maneuver element.

(e) AWCC Clearance.

1. All ARVN Artillery AWCC data will be passed to the ARVN Artillery Liaison Section on their artillery net.

2. The ARVN Artillery Liaison Section will fill out an AWCC form (Incl 2) and give it to the US Duty Personnel.

3. The US Duty Personnel will send the AWCC data to the agency responsible for broadcasting that information.

c. ARVN Artillery Support:

(1) When a request for ARVN artillery support is received, the request for fire form (Incl 3) is completed and given to the ARVN Duty Officer.

(2) The time and method of fire must be specified.

(3) All necessary clearance are obtained by the US Duty Personnel and given to the ARVN artillery Duty Officer.

d. US Artillery Support:

(1) When a request for US Artillery support is received, the request for fire form will be filled out by the ARVN artillery duty personnel, or whoever is requesting the support. The request will be given to the US duty personnel. An exception to this will be when the requestor can present his request in English. At this time there will be no need to fill out a request for fire form.

(2) The request will be sent immediately to the US Direct Support Artillery Battalion FDC where the mission will be processed.

(3) The time or method of fire will be specified if appropriate.

(4) All necessary clearances will be obtained by the CFSCC and sent to the US Artillery FDC.

e. Recording and reporting of Radar, SLAR, and Red Haze targets.

(1) These targets will be sent to the CFSCC by the Direct Support Artillery Battalion FDC.

(2) All targets will be plotted on overlay paper.

(3) Targets that cannot be engaged by US Artillery are given to the ARVN artillery to fire using the procedures outlined in requesting ARVN Artillery Support. The Direct Support Battalion will be notified of the disposition of the target.

(4) If the target cannot be engaged because there are ARVN or GVN troops in the area, the target will be immediately passed to the Sector Duty Officer so he can notify the friendly elements close enough to engage the target.

(5) At the completion of the surveillance period, the overlay will be given to the Sector Intelligence Officer.

f. Coordination of intelligence information.

(1) Intelligence information is normally received in the CFSCC through intelligence channels or from the District. To insure complete dissemination of intelligence information, the CFSCC will notify the appropriate intelligence agencies.

(2) Occasionally, the CFSCC will receive requests to attack intelligence targets.

(a) The CFSCC will coordinate the use of US and ARVN artillery as appropriate to attack these targets.

(b) The CFSCC will coordinate the use of ARVN, GVN, or US ground forces, Naval forces, or available air assets to check targets as appropriate and feasible.

(c) Action taken and the reported results will be disseminated to the appropriate intelligence agencies.

g. Coordination of preplanned fires.

(1) The CFSCC will coordinate preplanned fires for any element that desires them.

(2) The individual requesting preplanned fires will call, personally visit, or send a representative to the CFSCC with his request.

(3) The CFSCC will determine whether the ARVN or US artillery, or a combination of both will be best to support the requestor.

(4) Target information, the call sign, and frequency of the supported unit will be sent to the supporting unit or units.

(5) Target numbers and the call sign and frequency of the supporting unit will be given in return to the requestor.

(6) The CFSCC will obtain the required clearances and send them to the supporting unit. If the targets are permanent, the CFSCC will obtain the clearances daily. An example would be countermortar targets all permanent defensive concentrations.

h. General coordination and communications.

(1) The CFSCC is a vital communications and coordination link between the ARVN, GVN and US forces.

(2) In addition to the specific examples previously listed, the CFSCC will be prepared to effect any type of coordination or to pass any required information that might be requested. Examples are as follows:

(a) Accident prevention: Instant communications among all elements represented in the CFSCC prevent possible accidents such as firing artillery on friendly elements or friendly units firing on each other.

(b) Significant events: The instant reporting of significant events to all elements is quite helpful in keeping all concerned knowledgeable of everything that is occuring within their areas of interest in order that they can properly react if required.

FOR THE COMMANDER:

/s/ Lawrence A. Ritcey
/t/ LAWRENCE A. RITCEY
CPT, FA
Adjutant

DON XIN KHAI THONG DAN DAO

CLEARANCE REQUEST

TAO DO
GRID_____

LOCAI NHIEM VU DONG-DO
TYPE MISSION:

( ) Contact

VI-TRI NGHI-NCO CO VC
( ) Suspect VC Location

MUC-TIEU RADAR
( ) Radar Target

MUC-TIEU-TINH-BAO
( ) Intelligence Target

CHUAN-BI HOA-LUC CHO CAC CUOC HANH-QUAN
( ) Preparation Fires For Operations

MUC-TIEU PHONG THU
( ) Defensive Targets

SOI-SANC
( ) Illumination:

TOA DO CAN SOI SANG
Grid of Illumination_____

TOA DO CUA DIEN CHAM
Grid of Impact _____

OANH-KICH
( ) Airstrike

XIN KHAI-TRONG TU
Request clearances From:

TEN GIOI CHUC KHAI-THONG Clearance Initials		TEN CIOI CHUC KHAI-THONG Clearance Initials	
TTHO/TK ( ) Sector TOC	_____	( ) BEN LUC	_____
		( ) TAN TRU	_____
TRUNG DOAN 46 ( ) 46th Regiment	_____	( ) RACH KIEN	_____
TRUNG DOAN 50 ( ) 50th Regiment	_____	( ) BINH PHOUC	_____
		( ) CAN DUOC	_____
THU THUA	_____	( ) CAN GIUOC	_____

XIN PHOI KHAI-THONG VOI
Coordinating Clearances Required:_____

_____.

AWCC Form

LUU-Y VUNG HOAT DONG PHI-CO
Air Warning Clearance_____

PHAO-BINH VN
(VN Arty)

TOA DO DIEN CHAM
Grid of Impact_____

PHUONG-HUONG BAM
Direction of Fire_____

DUONG-TEN TOI DA
Maximum Ordinate_____

TAM KA DEN DIEM CHAN
Range to Impact_____

DON-VI BAN
Unit Firing _____

DIA-DEM
Location_____

GIO KHAI-HOA TU
Time to Fire - From_____

GIO DEN GIO
Hours to_____Hours

Incl 2 to CFSCC SOP

FIRE REQUEST FORM
DON KIN YEM TRO HOA-LUC

NAME (Duty Officer Requesting Fire)_____
TEN VI SI QUAN XIN YEM TRO HOA LUG

GRID_____ NO AND TYPE OF RDS REQUESTED_____
TOA DO SO VALOAI DAN YEU CAU

NATURE OF TARGET_____
TINH CHAT MUC TIEU

CONTACT_____ RADAR_____
CHAM DIGH PHAT GIAC

CONFIRMED VC_____ INTEL TGT_____
MUC TIEU XAC NHAM CO VC MUC TIEU TINH BAO

SUSPECTED VC_____
TINH NGHI CO VC

TIME TO FIRE _____ IF ILLUMINATION:
THOI GIAN BAN TRUONG HOP CHIEU SANG

GRID OF ILLUM_____
TOA DO CHIEU SANG

GRID OF IMPACT_____
TOA DO DUOI DAN ROI

UNIT OT FIRE_____
DON VI BAN

CLEARANCES ALREADY OBTAINED
DA DUCC CHAP THUAN

LOCATION VI TRI	INITIALS KY TAT	LOCATION VI TRI	INITIALS KY TAT

Incl 3 to CFSCC SOP

CFSCC REPORT

FROM:_____
(DATE/TIME)
TO:_____
(DATE/TIME)

1. Radar (AM Report only)

   a. Total sightings _____

   b. Total populated targets passed to ARVNs_____

      (1) Fired by ARVN Arty_____

      (2) Denied ARVN _____

      (3) Denied GVN _____

      (4) Denied US _____

2. Dufflebag, SLAR, and Red Haze Target (AM Report only)

   a. Total targets_____

      (1) Dufflebag_____

      (2) SLAR _____

      (3) Red Haze _____

   b. Total populated targets passed to ARVNs_____

      (1) Dufflebag_____

         (a) Fired by ARVN Arty_____

         (b) Denied ARVN _____

         (c) Denied GVN _____

         (d) Denied US _____

      (2) SLAR_____

         (a) Fired by ARVN Arty_____

         (b) Denied ARVN _____

         (c) Denied GVN _____

         (d) Denied US _____

Incl 4 to CFSCC SOP

(3) Red Haze_____

(a) Fired by ARVN Arty_____

(b) Denied ARVN _____

(c) Denied GVN _____

(d) Denied US _____

3. Total number of grids cleared during reporting period_____.

4. Remarks:

_____
(SIGNATURE)

ANNEX F

DEPARTMENT OF THE ARMY
US ARMY ADVISORY DETACHMENT
44th Special Tactical Zone
Adv Team #50 APO 96215

MACCZ-IV-50-3 7 December 1969

SUBJECT: Combat Operations After Action Report*
(RCS: MACJ3-32 R2
(Operation Cobra Strike)

THRU: Commanding General
Delta Military Assistance Command
ATTN: G-3 PLANS
USAAG, IV CTZ
APO 96215

TO: Commander
United States Military Assistance Command, Vietnam
ATTN: MACJ3-05
APO 96222

1. OPERATION COBRA STRIKE: See OPLAN Cobra Strike, Incl 1 (omitted).

2. DATES OF OPERATION: 301615 October 1969 to 031630 November 1969.

3. LOCATION: Reference Map VN Special Use, Seven Mtns Area, 1:50,000.

4. COMMAND HQ: 44th STZ, Cao Lanh, Vietnam

5. REPORTING OFFICER:

Principal US Advisors/Commanders	Principle RVN Commanders
Col Hassinger, SA, 44th STZ	Col Duc, DCO, 44th STZ
Maj Carter, ALO, 44th STZ	LTC Tro, Dep DCO Opns, 44th STZ
Maj LaPorte, SA, 67th Artillery Bn	Maj Lan, CO, 67th Artillery Bn
Maj Bridgewater, CO, MSF	Maj Phong, CO, MSF
Maj Bergeron, CO, B-7/1st Air Cav	

All air phases of this operation were principally planned and executed by US Forces with the concurrence of CG, 44th STZ. VN phases planned and/or conducted were artillery support, ground reaction force, and PSYOP campaign. VNAF participation was planned but VNAF was unable to provide required fighter support.

* Condensed and edited for consistency with other parts of this Lessons Learned. The substance is unchanged.

6. TASK ORGANIZATION: See OPLAN Cobra Strike, Incl 1. (omitted)

7. SUPPORTING FORCES:

a. HQ, 7/1st Air Cavalry Troop. 7/1st Air Cav provided one UH1H Command and Control (C&C) ship for the Senior Advisor, 44th STZ. 164th CAG provided backup C&C and one medical evacuation helicopter. The C&C ship was effective as the primary coordinating element throughout the operation.

b. 7th USAF.

Organization	Sorties	Aircraft	Mission
3rd Tac Ftr Wing	4	A-37	Fire suppression
3rd Tac Ftr Wing	6	F-100	Fire suppression
37th Tac Ftr Wing	12	F-4	Area denial
366th Tac Ftr Wing	8	F-4	Cave destruction
35th Tac Ftr Wing	2	F-100	Fire suppression
44th STZ	4	O-1E	FAC

All requests for mission aircraft were sent through the IV Corps Direct Air Request Net. One flight of F-100 aircraft was ordered on an immediate request for area fire suppression. All sorties met rendezvous and target timing as planned. Results: 8 caves destroyed; 2 caves damaged: all areas mined with CBU 42 generally as planned.

c. B-7/1st Air Cavalry Troop.

(1) 4 OH-6A (LOH)

(2) 4 AH-1G (Cobra gunships)

(3) 4 UH-1H (Slicks)

(4) 1 UH-1H Air Cav C&C ship

The missions of B-7/1st Air Cav were:

(1) Accurate target marking.

(2) Hostile fire suppression.

(3) Quick reaction force for downed aircraft.

The Air Cavalry Troop was employed continously throught the operation. Fire suppression was effective, target marking was accurate, and timing criteria were met.

d. Mobile Strike Force (MSF): Two companies of the 3rd MSF Bn were on alert at Chi Lang throughout the operation. The commanders (US&VN) flew in the Air Cav C&C on all phase II sorties. The operation did not require the committment of a reaction force.

e. Artillery: 47th Artillery Bn reinforced 2B/67th Artillery (Tri Ton).

(1) B Btry 47th Arty Bn - 155mm How, Chi Lang.

(2) C Btry 47th Arty Bn - 155mm How, Chi Lang.

(3) 2/B Btry 67th Arty Bn - 105mm How, Tri Ton.

Artillery fire began as planned at 301645 Oct 69, immediately following the B-52 strikes. Approximately 1,500 rounds were fired throughout the night of 30-31 Oct. Phase II was on weather hold from 310500 Oct to 020500 Nov during which time additional artillery was placed in the target area. On 030800 Nov, the arty fired approximately 500 rounds of suppressive fire in the vicinity of target #4 during a period of intense hostile ground fire.

f. 44th STZ ALO/FAC: USAF ALO and FACs were airborne throughout the operation. Weather checks were continuous from 310300 Oct through 020600 Nov in an effort to initiate phase II of the operation. The execution and control of all phases of the air mission were directed by the ALO through the FACs.

8. INTELLIGENCE: (omitted)

9. MISSION: "The 44th STZ conducts Special Air Operations to destroy VC/NVA personnel and base camp facilities located on Nui Giai and Nui Cam Mountains and to deny the enemy further access to the area."

10. CONCEPT OF OPERATION: Operation Cobra Strike was carried out in four phases:

a. Phase I (Strike) - Consisted of B-52 strikes in target area.

b. Phase II (Strike) - This phase was the main attack whereby artillery would be massed on the target complexes upon completion of phase I followed by the air attacks using suppressive fire (Napalm), Cobra gunships' suppressive fire, LOH for accurate target marking, and the attack of fighters with the Bullpup Guided Air Missile (GAM) for destruction of selected cave targets.

c. Phase III (Seed) - This phase of the operation consisted of a series of USAF fighters deploying CBU-42 canisters of anti-personnel mines in selected strips to restrict and deny the enemy freeedom of movement throughout the target complex.

d. Phase IV (PSYOP) - This phase consists of psychological operations warning the local population of the mining of the area, the dangers of entering the target area, and a Chieu Hoi Program to induce enemy elements to rally to the GVN.

11. EXECUTION:

a. General. Planning for Operation Cobra Strike began on 15 October 1969. Preliminary coordination was effected through 44th STZ ALO with elements of 7th USAF revealing that AF elements were willing to attempt the mission provided necessary approval was granted. On 26 Oct, an outline plan was submitted by SA, 44th STZ with concurrence of CG, 44th STZ, to HQ, DMAC and CG, IV CTZ. The plan was approved with the exception of the Mark 36 munitions requested. Additional CBU-42 munitions replaced the Mark 36 munitions in those areas. The plan was then forwarded to COMUSMACV J3 and JGS. Staff coordination and planning for OPLAN Cobra Strike began on 26 Oct 69. Concept and coordination meetings were held at 44th STZ HQ attended by commanders of forces concerned, with USAF being represented by the ALO, 44th STZ. OPLAN Cobra Strike was issued on 30 Oct 69.

b. Cobra Strike was initiated with phase I B-52 strikes on 301615 Oct 69 with Nui Giai being hit with two B-52 strikes. One strike at 1615 was followed by a second strike at 1630. Of seven B-52 strikes requested (four on Nui Giai and three on Nui Cam), only two were approved and carried out.

(1) 301615 Oct 69 Strike Alfa damage assessment: Estimated 10 KBA, 1 military structure destroyed, 3 military structures damaged, 10 bunkers destroyed, 15 bunkers damaged and 500 meters of trenchline destroyed. There were three secondary explosions and three sustained fires; one explosion had a 150 foot fireball. 99% of the ordnance landed in the target box and 100% of the surface was covered.

(2) 301630 Oct 69 Strike Bravo damage assessment: Estimated 20 KBA, 2 military structures destroyed, 1 military structure damaged, 15 bunkers destroyed, 25 bunkers damaged and 1000 meters of trenchline destroyed. There were three secondary explosions and three sustained fires; one explosion had a 100 foot fireball. 100% of the ordnance landed in the target box and 100% of the surface was covered.

(3) 301645 Oct 69. The artillery began firing on the target complex. These fires continued throughout the night of 30-31 Oct. Over 1500 rounds of 105mm and 155mm howitzer to further suppress the area and prevent the enemy from moving were placed on the two mountains prior to phase II, which was scheduled for 310725 Oct.

c. Phase II (Strike):

(1) This portion was developed around the primary attack weapon of this phase, the F-4 fighters with Bullpup missiles. Weather holds were taken into consideration in the plan to enable the ALO to hold all fighter sorties on the ground prior to launch, in the event adverse weather prevailed over the target area. 310630 Oct 69: All elements of the strike force, except fighter aircraft, assembled at Chi Lang, Chau Doc Province, RVN to initiate phase II. A hold was directed at 0700 by SA, 44th STZ due to weather conditions over the target areas. Phase II remained on weather hold until 311300 Oct when it was decided to postpone the operation until 010700 Nov. Artillery fires continued from 311800 Oct to 010500 Nov. Approximately 1400 rounds of 105mm and 155mm arty were fired into the target complex.

(2) A re-evaluation of the timing and sequence of events of fighter attacks was made and a decision reached to compress all fighter rendezvous times to a one-hour block, with a weather hold proceeding the rendezvous time by 1 hour. All fighter aircraft (napalm suppression F-100's and GAM attack F-4's) were placed on 15 minute scramble alert by IV DASC, in order to begin the attack at any time weather conditions would permit. The fighters were not given a specific rendezvous time. These times were to be determined by Ground Commanders at 1 hour from any time weather conditions would permit the attacks to begin.

(3) Elements of the phase II strike force again assembled 010600 Nov at Chi Lang. Adverse weather dictated that the phase be placed on hold again; the hold continued until 011300 Nov when the decision was made to postpone the phase until 020700 Nov. Artillery fires continued from 011800 Nov to 020500 Nov 69.

(4) 020530 Nov 69: Elements of phase II again assembled at Chi Lang airfield.

(a) The sequence of events was as follows:

0545 - Weather GO decision made; rendezvous time set for 0710.
0650 - CTC, FAC, and Air Cav elements on station. Fighters inbound.
0710 - F-4, GAM fighters rendezvous.
0712 - F-100(napalm suppression) fighters rendezvous.
0714 - FAC marked target #1.
0715 - F-100 suppressed with 2 napalm cylinders, followed by GAM dry run.
0718 - Cobra made suppressive run with flechettes.
0721 - LOH delivered 3 canisters red smoke inside target #1.
0725 - F-4 made 1st GAM run, with partial success.
0728 - F-4 made dry run on target #1 for closer look.
0732 - F-4 made 2nd GAM run, with partial success.

(b) A similar sequence of marking, suppressing, and launching the GAM's on targets #2, 3 and 4 took place. At 0850 a weather hold was ordered due to deteriorating weather conditions in the target complexes. Two sets F-100 (4) fighters with napalm and 2 sets of F-4 (4) fighters with GAM's expended on targets #1, 2, 3 and 4.

(c) 020900 Nov: Targets #1, 2, 3 and 4 attacked with missiles; targets #2 and #3 destroyed; targets #1 and #4 partially destroyed. Four KBA vicinity target #4. Operation placed on weather hold 0900 hrs.

(d) 021330 Nov: The SA, 44th STZ decided to postpone additional strikes of phase II until 030700 Nov because weather conditions were unacceptable for the fighters. It was decided to initiate phase III (seeding) in areas that would not conflict with phase II (strike), the weather being adequate for seeding opns. Due to the required rapid sequence of fighter passes and number of marking rounds that had to be placed, it was decided to use FAC's in the front seat of Cobra gunships carrying marking rockets, and another coordinating FAC in 01-A aircraft. This allowed the FAC to direct a Cobra pilot to mark 30+ targets accurately under cover of suppressive fire, without returning to the airfield for fuel or additional rockets. (Note: 01 aircraft carries eight marking rockets and Cobra carries 32).

(e) 021430 Nov: At 1440 the seeding aircraft arrived in the area. Two sets of fighters (4) seeded 16 strips between 1440-1535. Due to nonavailability of fighter aircraft, the operation ended for the day. Arty H&I fires were placed in the remaining target areas during the night of 2-3 Nov 69. The remaining portion of phase II was rescheduled to begin 030700 and phase III rescheduled to begin immediately upon completion of phase II.

(f) At 030530 Nov all elements of phase II again were in position at Chi Lang. The sequence of events was as follows:

0530 - C&C ship and control element arrive Chi Lang.
0545 - Weather GO. Decision made and first fighter rendezvous 0700.
0645 - C&C, FAC and Air Cav elements on station; fighters inbound.

Due to weather conditions over the targets, it was decided to engage targets #5, restrike #4, then targets #6 and #7 in that order.

0655 - F-4 GAM fighters (2) rendezvous followed by F-100s with napalm.
0702 - FAC marked target #5.
0704 - F-100 napalm suppression drop off target.
0706 - F-100 put two napalm on target.
0708 - Cobras made two suppressive runs, followed by LOH to mark target because target obscurred by smoke. Target remained obscurred, unable to mark.
0710 - Elements switched to strike target #4.
0712 - FAC marked target #4.

0715 - Cobra made 1st suppressive run followed by LOH. Both elements received ground fire. The LOH was hit and had to return to the airfield.
0720 - FAC directed F-100's on napalm and 20mm strikes until ordnance was expended.
0730 - ALO alerted GAM fighters to return to base with GAMs due to low fuel and deteriorating weather conditions.
0734 - Cobras continuing to make suppressive runs on target #4 expending all ammunition.

(g) C&C and Cav elements then returned to Chi Lang airfield. An immediate air strike was requested to further suppress the target area. Due to deteriorating weather conditions, it was decided to hold all fighters on the ground until weather improved. Artillery fires were placed in the area and approximately 500 rounds were adjusted by VN observer in 01 aircraft. At Chi Lang, the decision was made to use the Cobras as the marking element if the LOH became too vulnerable to ground fire. The LOHs up to this point had put red smoke grenades in the entrances of the five caves, providing utmost accuracy in marking the targets.

(h) Air Cav elements made VR of targets #5 and #7 while waiting for weather to lift. The VR revealed that targets #5 and #7 were not profitable; three additional caves were discovered near target #4. The decision was made to eliminate the attacks on targets #5 and #7; to strike #6, then restrike target #4 and the additional caves around target #4. At 1050 a weather GO decision was made for a 1200 hrs fighter rendezvous.

(i) The next sequence of events was as follows:

1155 - C&C, FAC and Cav elements were on station for target #6. GAM fighters rendezvous.
1200 - FAC marked target #6.
1202 - F-100 napalm drop off target.
1204 - F-100 put two napalm inside target #6.
1207 - Cav made two suppressive runs followed by LOH. 1st run target observed, 2nd run red smoke placed in target.
1210 - F-4 made 2 GAM runs; 1st GAM hit high, 2nd GAM hit and destroyed target.

All elements then shifted to south side of target complex to restrike targets #1, #4, and #3 and caves near target #4. These targets were engaged in the same sequence as earlier targets, except the Cobras were used to mark the target rather than the LOH. At 1405, phase II was completed, with the following results: targets destroyed-#6, #4, and three additional caves in vicinity of #4. Targets #1, #2, #3 were determined to be destroyed during phase II on 2 Nov. Total number of caves destroyed: 8. Targets #5 and #7 were cancelled; close recon of targets revealed no need for Bullpup missile attack.

d. Phase III began at 1430 with a set of two fighters scheduled every 30 minutes for a total of 10 sets. From the previous days experience, it was decided that the best way to successfully complete the mission in the available time was to have the FAC in the front seat of the Cobra gunships. The FAC, working with the gunship pilot, directed all marking and seeding operations beginning at 1435 and ending at 1645. Forty accurate passes were made during this period.

e. Phase IV - Chau Doc Province conducted air and ground PSYOP from 2 Nov to 2 Dec to warn the civilian population that areas on and around Nui Giai and Nui Cam have been mined and to intensify the Chieu Hoi Program in that area. The PSYOP consist of leaflet/loudspeaker missions daily and two civic action teams conducting ground loudspeaker missions in all the populated areas concerned.

12. RESULTS:

a. Phase I: 30 KBA, 3 military structures destroyed, 4 military structures damaged, 25 bunkers destroyed, 40 bunkers damaged, 1500 meters of trenchline destroyed, plus six secondary explosions and six sustained fires.

b. Phase II: 4 KBA, 8 caves destroyed.

c. Phase III: Nui Cam, Nui Giai seeded with 48 cannisters of CBU-42.

d. Phase IV: PSYOP to warn populace.

13. ADMINISTRATIVE MATTERS: (omitted)

14. SPECIAL EQUIPMENT AND TECHNIQUES: A helicopter equipped with a jungle penetrator was on standby at Chi Lang throughout the operation for immediate rescue of pilots downed in heavily-forested or otherwise inaccessible terrain. In view of the rugged terrain and heavy vegetation, the Air Cav commander decided to use flechette rockets for suppressive fires. For Phase III, the Cobra gunships were armed with smoke rockets to mark targets for the seeding aircraft. The gunships were highly accurate in marking targets and they were able to carry as many as thirty-two smoke rockets as opposed to eight that an 01 aircraft can carry. Also, their marking runs did not take as long as it would have for an 01 aircraft. For this phase a FAC flew in the front seat of the Cobra gunship to direct the target marking.

15. COMMANDER'S/ADVISOR'S SUMMARY AND COMMENTS:

a. Operation Cobra Strike was conceived, planned, and conducted when it became evident that an enemy regiment (+) and a probable higher control HA were located on Nui Giai and Nui Cam in the Seven Mtns area of Chau Doc Province, RVN. ARVN assets available had not been able to reduce the target and additional VN ground assets were not available in sufficient strength to undertake the mission.

b. Intelligence indicated that enemy HQ elements were using caves located in and on sides of a slotted valley known as "Death Valley" dividing the eastern and western halves of Nui Giai mountain. Due to depth and angle of entrances, multiple massive air strikes and artillery bombardment for the past two years had been unable to deny the enemy use of these caves. Due to steep and wooded slopes, heavy jumbled rock formations, and dense booby trap/mine fields, small enemy elements with automatic weapons had successfully stopped our attacks into the area. ARVN commanders recognized the threat but indicated they were unable to cope with it. Enemy on Nui Giai included anti-aircraft and sapper elements, as well as communications and CP facilities. Enemy on Nui Cam had harrassed Chi Lang Army Training Center and airstrip with indirect fire and sapper attacks.

c. As conceived and planned,Operation Cobra Strike would consist of four phases:

(1) Phase I - B-52 bomb strike on the cave area. This was to be followed by increased and sustained ARVN arty fires to keep the enemy pinned down and to suppress anti-aircraft fires.

(2) Phase II - Employment of GAMs (Bullpups) from USAF high performance aircraft to destroy/deny cave entrances. In order to obtain the precise target marking required by the GAMs in a restricted valley, it was decided to have a FAC mark the target. A high performance aircraft would then put in napalm. Following the napalm closely, an Air Cav troop moved in with suppressive fire from Cobra gunships. They were to be closely followed by LOH scouts who would drop a bundle of three smoke grenades in the cave entrance.

(3) Phase III - Employment of CBU-42 bomblet mines by aerial seeding on Nui Giai and Nui Cam. Immediately following phase II, seeding would start. A FAC in the Cobra gunship would provide accurate marks (smoke) for 32 passes by fighters. Fighter aircraft would sow strips of mines around sides and across tops of two mountains in areas known to be used by VC. 32 strips of mines were to be laid and reported to HQ IV Corps.

(4) Phase IV: ARVN planned and conducted PSYOP campaign to warn local populace to stay out of mined areas and not to support the enemy there. Loudspeakers and leaflets and Chieu Hoi passes were to be used.

d. Execution:

(1) Phase I: Two B-52 bomb strikes were placed on Nui Giai on 30 Oct. During the night, the 67th Arty Bn fired 1500 rounds at short intervals on all suspected enemy positions.

(2) Phase II: 310700 Oct 69 - All Army elements in position at Chi Lang airstrip.

(3) Phase III: Because of bad weather and low hanging clouds, USAF fighters were on weather hold on base strips. After a series of one-hour holds, Phase II was delayed (mid-afternoon) until the next day. ARVN arty resumed H&I fires.

(a) 1 Nov 69: A repetition of 31 Oct. Bad weather forced delay.

(b) 2 Nov 69: Targets #1, 2, 3, and 4 were engaged by GAMs. Weather was marginal. A combination of napalm fighters, gunship fire, and LOH marking proved necessary and accurate. Targets #1-3 destroyed. Weather closed in to below minimums for GAMs fighters. Decision made to start first part of Phase III. Seeding accomplished rapidly, due to use of gunships with FAC as markers; two minutes per fighter pass. Areas of Nui Giai and Nui Cam around perimeters of mountains and away from remaining GAMs targets were seeded. Result - first half of Phase I and Phase II accomplished on 2 Nov.

(c) 3 Nov 69: LOH recon revealed that caves #5 on Nui Giai and #7 on Nui Cam were not accessible to the enemy; these two targets were dropped. Using planned sequence, target #4 was engaged again by GAMs. LOHs and gunships received anti-aircraft fire from cave #4 and three newly-discovered caves in the vicinity. One LOH was hit and returned to Chi Lang. Fighters placed on hold. ARVN 67th Arty CO went up with FAC and placed two hours of 155mm fire (480 rds) on cave #4. Three of four caves near #4 destroyed by GAMs. Cave #6 engaged and destroyed; burned for 10 minutes with heavy black smoke. Phase II fighters brought in and seeding operations on both mountains completed by 1700. At 1715, FAC reported 100 enemy in open moving from Nui Cam to Nui Giai. Air cavalry brought back; enemy driven into side of Nui Giai and newly seeded area, with unknown results.

(4) Phase II and III Command and Control: Coordination and precise control was the key factor. Five different aircraft (USAF and Army) were in a small and restricted area at the same time and were a mixture of high-performance fighters, helicopters, and FAC aircraft. It was necessary to have airborne control over the area at all times when targets were engaged, including seeding operations.

(5) Phase IV: 4 Nov 69 - HQ, 44th STZ and Chau Doc Province G-5/S-5 sections followed up with loudspeaker/leaflet drops from VNAF light aircraft and C-47 aircraft in the vic of Ba Chuc, Ba Xoai, Chi Lang, and Tri Ton. People were warned to stay off Nui Giai and Nui Cam because the area was mined. People were urged not to support VC/NVA units and the enemy was urged to rally to the government.

(6) Results: On 3 Nov, immediately following phase III seeding operations, an estimated 100 enemy attempted a rapid daylight move from Nui Cam to Nui Giai. They were brought under fire from gunships and chased into an area recently seeded with three strings of mines. There have been continuing reports of numerous isolated explosions on the mountains from areas previously used as indirect fire positions. A Hoi Chanh reported that his unit attempted to infiltrate up Nui Giai. It took casualties and become disorganized; he rallied at Ba Chuc. In the Ba Chuc area, a number of civilians have been killed taking supplies into the mountains. Since then the local populace has refused to carry supplies into the mountains. The seeding operations have effectively denied the VC exploitation of the civilian labor force, which previously was easy to obtain. VN civilians in Tri Ton report that in a matter of days, over one hundred VC from the Z 28 Bn were killed on Nui Cam. Usually reliable US intellignece sources indicate enemy CP operations have moved to more exposed positions on the top of Nui Giai and out in the flat areas around the base of the mountain. Movement of enemy units and personnel, as well as his capability to reinforce in the mountain areas, appear to have been curtailed.

16. LESSONS LEARNED:

a. Detailed planning, coordination and briefings at all levels are required in view of the variety of units, elements, types, and capabilities of aircraft involved. The requirement for close timing and the coordination of the use of congested and restricted air space also requires detailed planning and coordination.

b. The tactical air controller and the operation commander must remain in the air where they can view the target area at all times during the air operation.

c. Weather is a most critical factor in the planning and conduct of these operations. Available forecasts are too general and cover too much area to be of real value to the specific target area. Planning must be flexible enough to permit weather delays with fighters on strip alert. Higher HQ must depend on and be willing to accept hour by hour Go-no-Go decisions by the ground commander. Planning should permit delays and flexibility during the operation.

d. Extensive and detailed contingency planning is a must, to include obtaining special equipment, briefing of commanders and pilots, and command and control measures.

e. Artillery is invaluable in maintaining pressure on the enemy and for anti-aircraft fire suppression during delays.

f. Seeding by aerial mines does not stop or eliminate the enemy but rather only slows and restricts his movement.

g. Some commanders desired to place artillery fires where an occasional mine was detonated in the days following the operation. It was necessary to explain that arty fire would detonate other mines in the area and clear a gap for the enemy. Conversely, if a number of mines went off it indicated an attempt by the enemy to either clear a gap or move troops through. In such cases artillery fires were appropriate, to be followed by reseeding as soon as possible.

h. GAMs are 50-75% accurate under marginal weather conditions, if detailed briefings are provided by FACs and tight control is maintained. Under better conditions, accuracy goes up to 90%+. A minimum of two GAMs per point target should be planned.

i. Fighter aircraft with napalm are required to be on station during the GAM operation.

j. There was a large number of seeding strings and a requirement to complete seeding in a short time to prevent enemy movement out of the area. Seeding is done with high performance jet aircraft with relatively low loitering time available due to fuel consumption. In order to provide accurate strip starting marks, with minimum time between fighter passes, a FAC was positioned in the front seat of Cobra gunships, which can carry 32 marking rockets. Using the gunships to go in with suppressive fire marking with WP permitted close accurate marking and a minimum of two minutes between fighter passes. Therefore, the entire area was accurately seeded within the allowable time.

k. Special techniques had to be developed to provide data for mine field reports. Using an accurate starting mark provided by the gunships, the fighter dropped on the mark and on a heading provided by the FAC. As the fighter pulled out he reported his actual heading during the run. Using the starting point and the heading reported, mine strips were recorded. They were based on the known density of mines per canister dropped and the width and length of the strip covered by one pass. On completion of the operation, the ALO and FAC prepared an overlay showing mine field coverage which was incorporated into the US/ARVN Mine Field Report and disseminated to the HQ concerned.

l. Planning should permit the engagement of targets of opportunity and/or shift of target priority during the operation.

m. Density of seeding should be increased in heavily wooded areas due to restriction of kill radii by undergrowth. Reseeding must be considered in the original planning.

n. Restriction of planning and information to a strict need-to-know basis was instrumental in achieving the element of surprise and containment of enemy in the target area.

o. An operation of this type is an excellent way of transferring the initiative from the enemy to friendly forces.

p. As a result of Operation Cobra Strike, CG IV CTZ personally planned and directed both reseeding operations in the target areas and in other areas of IV CTZ. Province officials recommended additional seeding areas in the Nui Cam and Nui Giai areas. All three mountains were reseeded either in new areas or in greater density in previously seeded areas on 18-19 November 1969.

q. On 9 Nov, Nui Coto was evacuated and was seeded when it became evident friendly troops available could not hold the mountain.

17. RECOMMENDATIONS: That -

a. Counterpart personnel at Corps level and above, as well as subordinates, participate in the planning and execution of seeding operations.

b. The planning phase of a seeding operation include an orientation for all command personnel concerned on the capabilities and limitations of ordnance used and restrictions on firing into seeded areas.

c. AH-1G (Cobra Gunships) with FAC's on board be used for marking CBU-42 canister drops.

d. A1E's be used in pairs for fire suppression rather than jet type aircraft or aircraft in larger numbers.

e. Extensive PSYOP be planned to coincide with or immediately follow artillery fires.

f. Any anti-aircraft fire suppression include use of all available artillery fires.

g. An alternate C&C ship with identical communications be on continuous standby in operations area to insure uninterupted command and control.

1 Incl
as (omitted)

s/R.W. HASSINGER
Col Infantry
Senior Advisor

ANNEX G

GLOSSARY OF ABBREVIATIONS

AAA - Antiaircraft Artillery

AAGS - Army Air-Ground System

AF - Air Force

AGL - Above Ground Level

Air Cav - Air Cavalry

ALO - Air Liaison Officer

ANGLICO - Air and Naval Gunfire Liaison Company

AO - Area of Operations

ARLO - Air Reconnaissance Liaison Officer

Arty - Artillery

ARVN - Army of the Republic of Vietnam

AASWCC - Artillery and Air Strike Warning Control Center

BDA - Bomb Damage Assessment

BLU - Bomb Live Unit

Bn - Battalion

CAG - Combat Aviation Group

cal - Caliber

CAS - Close Air Support

CBU - Cluster Bomb Unit

C&C - Command and Control

CEP - Circular Error Probable

CFSCC - Combined Fire Support Coordination Center

CG - Commanding General

CIC - Combat Information Center

CICV - Combined Intelligence Center, Vietnam

CO - Commanding Officer

COC - Combat Operations Center

COMNAVFORV - Commander, US Naval Forces, Vietnam

COMUSMACV - Commander, US Military Assistance Command, Vietnam

CP - Command Post

CRC - Control and Reporting Center

CRP - Control and Reporting Post

CSC - Coastal Surveillance Center

CTF - Commander, Task Force

CTG - Commander, Task Group

CTOC - Corps Tactical Operations Center

CTU - Commander, Task Unit

CTZ - Corps Tactical Zone

DAS - Direct Air Support

DASC - Direct Air Support Center

DCO - Deputy Commanding Officer

DCS - Deputy Chief of Staff

Dep - Deputy

DEP - Deflection Error Probable

DEPCOMUSMACV - Deputy Commander, US Military Assistance Command, Vietnam

DISUM - Daily Intelligence Summary

DMAC - Delta Military Assistance Command

DMZ - Demilitarized Zone

DS - Direct Support

FA - Field Artillery

FAC - Forward Air Controller

FDC - Fire Direction Center

FFAR - Folding Fin Aerial Rocket

FFORCEV - Field Force, Vietnam

FM - Frequency Modulation

FO - Forward Observer

fps - feet per second

FSB - Fire Support Base

FSC - Fire Support Coordination

FSCC - Fire Support Coordination Center

FWMAF - Free World Military Assistance Forces

Frag - Fragmentary (order)

FSCOORD - Fire Support Coordinator

GAM - Guided Air Missile

GDA - Gun Damage Assessment

GP - General Purpose

GS - General Support

GSR - General Support Reinforcing

GURF - Guns Up Ready Fire (Report)

GVN - Government of the Republic of (South) Vietnam

HE - High Explosive

HEAP - High Explosive, Antipersonnel

HEAT - High Explosive, Antitank

HF - High Frequency

H & I - Harassment and Interdiction

HQ - Headquarters

ICM - Improved Conventional Munition

IPIR - Immediate Photo Interpretation Report

JAGOS - Joint Air-Ground Operations System

JCS - Joint Chiefs of Staff (US)

JGS - Joint General Staff (Vietnamese)

KBA - Killed by (Air) (Artillery)

KIA - Killed in Action

KTAS - Knots True Airspeed

KW - Kilowatt

lb(s) or # - pound(s)

LO - Liaison Officer

LOH - Light Observation Helicopter

LZ - Landing Zone

M - Model

m - meter(s)

MACV - Military Assistance Command, Vietnam

MAF - Marine Amphibious Force

MAW - Marine Aircraft Wing

MIB(ARS) - Military Intelligence Battalion (Air Reconnaissance Support)

MK - Mark

mm - millimeter(s)

mph - miles per hour

MSF - Mobile Strike Force

NGF - Naval Gunfire

NGFS - Naval Gunfire Support

NGLO - Naval Gunfire Liaison Officer

NVA - North Vietnamese Army

OPLAN - Operation Plan

PPIF - Photo Processing and Interpretation Facility

PSYOP - Psychological Operations

Recon - Reconnaissance

REP - Range Error Probable

RVN - Republic of (South) Vietnam

RVNAF - Republic of Vietnam Armed Forces

SA - Senior Advisor

SAC - Strategic Air Command

SEA - Southeast Asia

SLAR - Side-Looking Airborne Radar

SOP - Standing Operating Procedure

SP - Self Propelled

SSB - Single Side Band
SSZ - Specified Strike Zone
STZ - Special Tactical Zone

SUPIR - Supplemental Photo Interpretation Report

TACAIR - Tactical Air

Tac Ftr - Tactical Fighter

TACC - Tactical Air Control Center

TACP - Tactical Air Control Party

TACS - Tactical Air Control System

TAOI - Tactical Area of Interest

TAOR - Tactical Area of Responsibility

TASE - Tactical Air Support Element

TOC - Tactical Operations Center

TOE - Table of Organization and Equipment

TOT - Time (on) (over) Target

TRW - Tactical Reconnaissance Wing

UNREP - Underway Replenishment

US - United States

USA - United States (Army) (of America)

USAF - United States Air Force

USMC - United States Marine Corps

USN - United States Navy

UHF - Ultra High Frequency

VC - Viet Cong

VHF - Very High Frequency

VN - Vietnam(ese)

VN - Vietnamese Navy

VNAF - Vietnamese Air Force

VR - Visual Reconnaissance

WP - White Phosphorus

7AF - Seventh US Air Force

- pound(s)

DISTRIBUTION:

4 - SJS (2 for Mil History)
2 - J1
14 - J2
6 - MATTLO
2 - J3-01
1 - J3-02
1 - J3-03
1 - J3-04
25 - J3-05
2 - J3-06
1 - J3-07
1 - J3-08
1 - J3-09
1 - J3-10
1 - J3-11
5 - J3-12 (3 for JGS)
2 - J4
2 - J5
2 - J6
5 - MACCORDS
1 - MACDC
4 - MACSA
60 - MACT
4 - MACOI
2 - MACSOG
1 - Chief, Combined Studies
4 - DODSPECREP
2 - Chief, ARPA-RDFU-V
1 - Chief, PVNTMED (USAID/PH)
60 - CG, USARV
2 - LnO, USACDC
4 - CO, ACTIV
5 - USARV Advisor School (Provisional)
25 - COMNAVFORV
50 - CDR, 7th AF
1 - 7th AF (IGS)
2 - CO, 834 AD (DO)
150 - CG, III MAF
250 - CG, I FFORCEV
250 - CG, II FFORCEV
15 - CG, DMAC
10 - CG, CMAC
1 - CO, USAHAC
250 - Ea SA, I, II, III & IV Corps (1 to each Sr Adv out to and including Bn and Subsector)
15 - Ea Chief, Naval Adv Gp
Chief AF Adv Gp
1 - Railway Security Adv Det
10 - Ea SA, Abn Div, RF/PF, Marine Adv Gp (1 to each Sr Adv out to and including Bn and subsector)
1 - Ea SA, I, II, III, IV & V ALC
1 - 4th PSYOP Gp
10 - 5th SFG
1 - 5th SFG (CLD-SAIG)
8 - CO, 459 Sig Bn
2 - NRDU-V
5 - COMRIVPATFLOT
6 - COMCOSRON ONE
7 - COMRIVSTRIKEGRU
7 - COMCOSFLOT I
7 - NAVLEDMAC
1 - CO, UDT ELEVEN
1 - CO, UDT TWELVE
1 - CO, UDT THIRTEEN
2 - 821st CSPS (Safeside)
2 - 3 Cmbt Spt Gp (BSP)
2 - 12 Cmbt Spt Gp (BSP)
2 - 31 Cmbt Spt Gp (BSP)
2 - 35 Cmbt Spt Gp (BSP)
2 - 37 Cmbt Spt Gp (BSP)
2 - 366 Cmbt Spt Gp (BSP)
2 - 377 Cmbt Spt Gp (BSP)
2 - 632 Cmbt Spt Gp (BSP)
2 - 633 Cmbt Spt Gp (BSP)
15 - JGS, J3
1 - JGS, J5
10 - CMD
10 - JGS, Central Tng Comd
2 - FWMAO
12 - FWMAO (AFV)
5 - FWMAO (NZV Force)
2 - FWMAO (MACROC-V)
41 - FWMAO (ROK-V)
30 - FWMAO (RTFV)
3 - CDR, ROCMAGV
5 - CINCPAC
5 - CINCUSARPAC
10 - CG, USARHAW
1 - GC, Tripler AMC
1 - COMNAVSPECWARGRUPAC

3 - COMPHIBPAC
6 - CINCPACAF (1 to DMWPE)
1 - CO, 7AF/13F (DSP)
2 - CG, 3d AD (DO)
2 - CO, Jungle Survival Sch (Clark AFB)
5 - CG, USARYIS
5 - Comdt, USARPAC Intel Sch
2 - CG, 8th US Army
12 - USARKOREA
1 - CO, 314th Air Div (DSP)
1 - COM 354 TFW
2 - COMUSJAPAN
2 - 39th Ari Div
10 - CHAAGCHINA
15 - Chief, JUSMAGPHIL
2 - CHMILTAGINDONESIA
15 - COMUSMACTHAI
5 - CG, USARSUPTHAI
2 - Chief, ARPA-RDFU (THAI)
6 - USMILADREP, SEATO
2 - USARMA, LAOS
2 - CHMEDTBURMA
10 - Chairman, JCS
40 - DIA (DIACO-3)
1 - DIA (DIAAP-10A2)
20 - SACSA
10 - OSD, ARPA
5 - Defense Document Center
10 - Vietnam Tng Center (Foreign Service Institute
10 - CofSA
10 - ACSI, DA
5 - DCSPOS, DA
10 - DA, ACofS, FOR
5 - Chief, R&D, DA
1 - ACTIV Ln Off, ACSFOR, DA
5 - CNO
5 - CSAF
4 - HQ USAF (AFISP-S)
10 - CMC
2 - COMDT, MWC
2 - COMDT, ICAF
5 - COMDT, AFSC
3 - CG, USAMC
15 - CG, USACDC
2 - CG, USACDCEC
1 - USACDC, MP Agency
3 - CO, USA Lim War Lab
5 - CG, USCONARC
2 - CG, First Army
2 - CG, Third Army
2 - CG, Fourth Army
2 - CG, Fifth Army
2 - CG, Sixth Army
5 - CG, III Corps
6 - CG, XVIII Abn Corps Arty
5 - CG, 1st Armd Div
5 - CG, 2d Armd Div
5 - CG, 5th Mech Div
8 - CG, 24th Inf Div
15 - CG, 82d Abn Div
5 - COMDT, USAWC
6 - COMDT, USACGSC (1 Mil Review)
3 - Supt, USMA
2 - USAAC (Ft Rucker)
1 - COMDT, USAAD Sch
5 - COMDT, USAAMS
5 - COMDT, USAARMS
5 - COMDT, USAAVNS
2 - COMDT, USACA Sch
2 - CO, USA Cbt Surv Sch
2 - COMDT, USACMLCS
2 - COMDT, USAES
2 - USA FTC (Ft Rucker)
5 - USAIC (Ft Benning)
5 - COMDT, USAINTS
5 - COMDT, PMG Sch
2 - COMDT, USAQMS
2 - COMDT, USA Sig Sch
6 - COMDT, USASMA (Ft Bragg)
2 - COMDT, USA Trans Sch
5 - USA S/TC (Ft Gordon)
5 - USA S/TC (Ft McClellan)
5 - USATC (Ft Benning)
5 - USATC (Ft Bliss)
5 - USATC (Ft Bragg)
5 - USATC (Ft Campbell)
5 - USATC (Ft Dix)
3 - USATC (Ft Jackson)
5 - USATC (Ft Knox)
5 - USATC (Ft Lewis)
6 - USATC (Ft Ord)
5 - USATC (Ft Polk)
5 - USATC (Ft L. Wood)

3 - Chairman, JTCG/ME (APG)
2 - Pres, Naval War College
1 - Supt, USNPGS
2 - COMDT, USN Amph Sch
2 - CO, NAVPHIBSCOL, CORO
1 - CO, BOATSUPPU ONE
1 - CO, Beach Jumper UNIT ONE
1 - CO, Beach Jumper UNIT TWO
1 - CO, BSU-TWO
1 - CO, UDT-TWENTY ONE
1 - CO, UDT-TWENTY TWO
3 - CO, Seal Tm 1
3 - CO, Seal Tm 2
2 - CO, Naval Inshore Ops Tng Cen
1 - PAC Msl Range
1 - CO, Naval Wpns Cen
1 - COM NAV Const Bn
2 - Supt, USAFA
5 - Dept of Hist, USAFA
1 - Aero Systems Div (ASBEE-10)
2 - AU Library
5 - Dept of Air Police Tng
3 - Hq Aero Sys Div (AFSC)
3 - Hq For Tech Div, AFSC
1 - Air Tng Comd (ATOPT-S)
1 - Dir, Special Air Warfare Sch
10 - 479th Tac Ftr Wg
1 - 3636 Cmbt Crew Tng Gp (CCT-OT)
2 - Armt Dev & Test Cen (ADFS)
2 - Fld Tng Det (TDBAS-2)
1 - General Research Corp
2 - CG, Marine Corps Base, Cp Pendleton
2 - CG, Marine Corps Base, Cp Lejeune
2 - CG, Marine Corps Recruit Depot, San Diego
2 - CG, Marine Corps Recruit Depot, Parris Island
5 - CG, FMF, LANT
5 - CG, FMF, PAC
1 - CO, Landing Force Tng Comd, Pac
1 - COMPHIBTRAPAC
2 - CG, Marine Corps Dev & Ed Comd
8 - CINCAL
14 - CG, USARAL
6 - CINCLANT
5 - CINCLANTFLT
3 - COMPHIBLANT
3 - COMPHIBTRALANT
1 - COMNAVSPECWARGRULANT
1 - NAV Ops Spt Gp LANT
1 - CINCEUR
10 - CINCUSAREUR
2 - CG, 7th US Army
2 - CINCSTRIKE
4 - HQ, USAFSTRIKE
3 - CINCSOUTH
15 - US ARMY FORCES, SOUTHCOM
2 - USA School of Americas
2 - COMDT, USA Jungle Warfare Sch

MACV LESSONS LEARNED INDEX

NUMBER	DATE	SUBJECT
1	30 Mar 62	Heliborne Operation Cai Ngay, An Xuyen Province
2	30 Mar 62	Airmobile Operation in I Corps
3	11 Apr 62	Operation JUNGLE JIM
4	11 Apr 62	Ranger Task Force Operation in Vinh Binh Sector
5	11 Apr 62	Multi-Battalion Operation in Northern Tay Ninh Province
6	11 Apr 62	Operations in Phuoc Thanh Sector to Relocate Civilians
7	18 Apr 62	Operation DAN TIEN VIII
8	23 Apr 62	Operation CA CHEP
9	27 Apr 62	Operation in Kien Hoa Sector
10	1 May 62	VC Ambush-Trung Lap, Binh Duong Province
11	5 May 62	Operation TIGER HUNT
12	10 May 62	Operation RAINDROP
13	16 May 62	Operation NGUYEN HUE
14	Undated	Operation SON CA
15	15 Jun 62	Ambush Techniques
16	19 Jun 62	Review of Lessons Learned 1 - 15
17	25 Jun 62	Techniques Dealing with Airmobile Assaults
18	24 Jul 62	Tips and Combat Experiences
19	31 Jul 62	Operation SUNRISE
20	27 Aug 62	Indiscriminate Use of Firepower
21	28 Aug 62	Ambush Techniques

Incl 3

22	8 Sep 62	Operations of US Army Helicopters
23	5 Oct 62	Operation BINH TAY
24	13 Nov 62	Airmobile Raids Against Superior Forces
25	17 Dec 62	Search Techniques
26	18 Jan 63	M113 Operations
27	28 Feb 63	Ambushes
28	18 Apr 63	Guidelines for Advisors
29	17 May 63	Ambush in BINH CHANH
30	17 Aug 63	Psywar and Civic Action Operations
31	27 Sep 63	Artillery Organization & Employment in Counterinsurgency
32	19 Oct 63	Eagle Flight Operations
33	29 Oct 63	Utilization of Military Dogs
34	30 Nof 63	Railway Security
35	10 Jan 64	Clear and Hold Operations
36	4 Feb 64	Fire and Maneuver
37	10 Feb 64	Vehicle Convoy Organization and Control
38	12 Mar 64	Area Saturation Operations
39	11 Mar 64	Ambush Operations
40	23 Mar 64	Corps Psywar/CA Operations Center
41	28 Jul 64	Operations of Seabee Technical Assistance Teams
42	7 Oct 64	VC Employment of Land Mines
43	22 Dec 64	Combat Tips I
44	23 Jan 65	Elimination of Viet Cong Infrastructure
45	12 Feb 65	Viet Cong Tunnels
46	3 Mar 65	Recent Operations

47	30 Mar 65	River Assault Group Operations
48	7 Apr 65	Combat Tips II
49	13 Apr 65	Operation HOAI AN
50	13 Apr 65	Naval Conduct of Amphibious Operations
51	24 Apr 65	Operational Employment of Riot Control Munitions
52	22 Nov 65	Operational Employment of the Mity Mite Portable Blower
53	29 Sep 66	Viet Cong Improvised Explosive Mines and Booby Traps
54	27 Jan 66	The Battle of Ky Phu
55	15 Mar 66	The Battle of Annihilation
56	18 Apr 66	Operations Against Tunnel Complexes
57	25 May 66	Pursuit
58	20 Jun 66	Operation HAPPY VALLEY
59	13 Jul 66	Employment of Image Intensification
60	5 Oct 66	Defense Against Mortar/Recoilless Rifle Attacks
61	27 Jan 67	Salient Lessons Learned
62	11 Mar 67	Salient Lessons Learned
63	25 Apr 67	Search and Rescue Operations
64	15 Sep 67	Imitative Communications Deception
65	20 Oct 67	Population and Resources Control
66	10 Nov 67	Countermeasures for 102mm, 122mm and 140mm Rockets
67	4 Apr 68	Defense
68	20 Jul 68	Viet Cong Base Camps and Supply Caches
69	10 Sep 68	Analysis of Enemy Positions at Khe Sanh and Evaluation of the Effectiveness of Weapons Systems Against Enemy Fortifications

70	17 Oct 68	Friendly Casualites from Friendly Fires
71	13 Mar 69	Countermeasures Against Standoff Attacks
72	16 Nov 68	Aerospace Rescue and Recovery in South Vietnam
73	20 Nov 68	Defeat of VC Infrastructure
74	15 Sep 68	Accidental Herbicide Damage
75	20 Jan 70	Cordon and Search Operations
76	22 Nov 69	Vietnamization
77	See Cover Letter	Fire Support Coordination
78	17 Feb 70	Action at Long Khot
79	8 Mar 70	Enemy Exploitation of Allied Tactical Communications

MACV COMBAT EXPERIENCES INDEX

NUMBER	DATE	SUBJECT
1 - 69	6 Jun 69	Definse Against Sapper Attacks; Sniper Training and Employment; Small Unit Operations.
2 - 69	29 Jul 69	Tactical Cover and Deception (C & D) in Counterinsurgency Operations.
3 - 69	7 Sep 69	Task Force Remagen; Experiences with Enemy B-40 and B-41 Rockets; Naval Forces Operations; Bridge Security Against Underwater Sapper Attack.
4 - 69	3 Nov 69	Bunker Busting/Land Clearing; Sapper Actions of North Vietnam Communists; FAC Operations; KBAR/VAMPIRE Concept; Anti-Rocket Program.
5 - 69	5 Jan 70	Viet Cong Attack on Regional Force Outpost; Pacification of Quang Dien District.
6 - 69	15 Jan 70	"To Build, Not to Destroy...", Air Ambush, Surveillance Task Force.
1 - 70	1 Apr 70	Tactical Cover and Deception

Requests for any MACV Lessons Learned or Combat Experiences should be addressed to the Defense Documentation Center, ATTN: DDC-TCA, Cameron Station, Alexandria, Va. 22314.